NOVEMBER 25, 1996 VOLUME 13, NUMBER 48

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Cisco steals a page from IBM's playbook

By Michael Cooney
Raleigh, N.C.

The gloves are off...again.

Cisco Systems, Inc. will take a swing at IBM next month when it announces a new mainframe connectivity technology for its channel-attached router that should look awfully familiar to Big Blue.

That's because the MultiPath Channel (MPC) technology Cisco is implementing in its Channel Interface Processor (CIP) router software comes from IBM — even though IBM has not officially licensed MPC to anyone, including Cisco.

The story of how Cisco could implement MPC without IBM's blessing — and with the threat of possible patent or license infringement actions — is a tale worthy of a soap opera. Sources indicate that MPC specifications, or at least parts of them, are contained in other licenses Cisco has from IBM, namely the Enterprise Systems Connection (ESCON) and Advanced Peer-to-Peer Networking agreements it signed in the past couple years.

But there is also the fact that Cisco quietly bought Metaplex Pty., Ltd. of Sydney, Australia, recently. Metaplex, a six-year-old firm specializing in the development of SNA communications software, helped IBM develop MPC and other channel connectivity technology.

MPC: What is it good for?

IBM's MPC is used to communicate between multiple mainframes today, but it is MPC's long-term strategic role that

See Cisco, *page 14*

IBM pitching IP switching

IBM offers up its ARIS scheme as an industry standard.

By Michael Cooney and Jim Duffy
Hawthorne, N.Y.

In an attempt to ride the IP switching wave instead of being drowned by it, IBM has come up with a switching scheme it claims is more flexible and scalable than the competition's.

IBM has submitted its Aggregate Route-Based IP Switching (ARIS) proposal to the Internet Engineering Task Force with an eye toward garnering industry support for the scheme and becoming a significant player in the fledgling IP switching market.

"We have come up with a highly scalable technology that will let us, via the addition of a simple protocol, [ARIS], utilize switching technologies in the Internet," according to Rick Boivie, an engineer with IBM's advanced networking lab here.

See IBM, *page 13*

THE INSIDE DOPE: IBM'S ARIS PROPOSAL

IP-based networks use a number of routing protocols, including RIP, OSPF, IS-IS and BGP, to determine how packets ought to be routed... In this memo, we describe a mechanism which uses these protocols as the basis for switching IP datagrams, by the addition of a simple protocol ("ARIS") that establishes switched paths through a network. The ARIS protocol allows us to leverage the advantages of switching technologies in an internet network. This memo is defined with respect to ATM. ARIS can be easily extended to other switching technologies.

FEAST OR FAMINE?

Gigabit Ethernet start-ups tell us over dinner that they're hungry for your business.

By Jodi Cohen and Bob Brown
Santa Clara, Calif.

Introductions weren't necessary.

The five Gigabit Ethernet industry pioneers *Network World* hosted for dinner last Tuesday night here were quite familiar with one another from past network industry battles. And they're sure to be seeing lots more of each other in the months ahead as they promote The Next Great LAN Technology.

Our premise for the gathering at Birk's, a popular Silicon

See Dinner, *page 15*

DINNER CONVERSATION
- Gigabit Ethernet's role in the network
- How to penetrate Cisco's installed base
- Whether Gigabit Ethernet start-ups can survive
- How routing and high-speed switching fit together

Our guests (l, r): Rapid City's Joe Kennedy, Extreme's Gordon Stitt, Prominet's Menachem Abraham, StarRidge's Bobby Johnson and Packet Engines' Bernard Daines.

DAVID WEINTRAUB

Dedicated Internet devices lack important Web functions

By John Cox

To those in the know, network computers (NC) are also known as thin clients. But these devices may be so thin that they lack some of the advanced Web functions PC users have come to expect. So if playing audio, working in 3-D or running animated .GIF files is important for users on your corporate Web, you might not want to be the first on your block to buy into NCs.

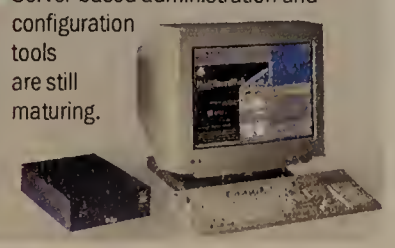
Why is it that devices designed in large measure for the Internet/intranets are unable to access some of the most advanced features? Chalk it all up to the still immature but rapidly developing software environment — the Java programming language, the Java Virtual Machine (JVM) that interprets code and Web browsers that incorporate the JVM.

Another big issue is applications. To a large extent, in-house and third-party applications have to be written, or rewritten, to run natively in Java.

For example, Sun Microsystems, Inc.'s JavaStation, now in

See NC, *page 57*

LIMITS OF NETWORK COMPUTERS
- Most devices are still in beta but due out starting Q1 1997.
- Functionality of Java-based Web browsers lags behind Windows browsers.
- Third-party Java application portfolio is very limited.
- Java applet performance varies, depending on NC's processor.
- Server-based administration and configuration tools are still maturing.



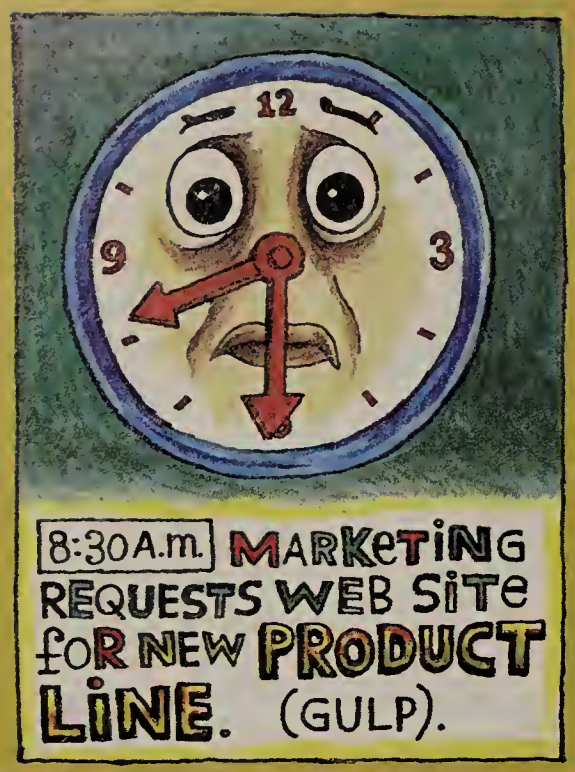
Netscape and Corel talking about bundles

By Carol Sliwa
Ottawa

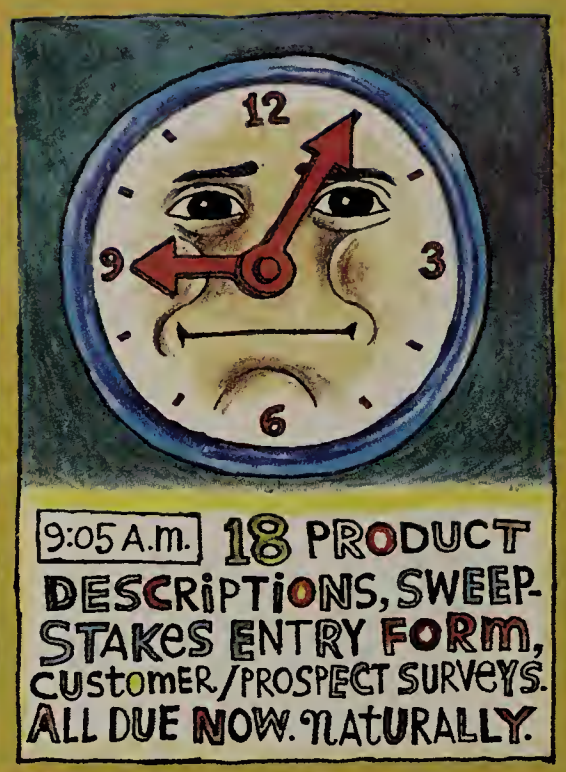
Microsoft's stranglehold on productivity software could be tested by Java allies Corel and Netscape.

The two Microsoft Corp. rivals are currently involved in discussions on a variety of fronts, including possible bundling arrangements of their products. One of the most tantalizing prospects would have Corel Corp.'s Office for Java included with Netscape Communications Corp.'s upcoming Communicator groupware client. If completed, such a deal would give end users a browser, E-mail, groupware and a

See Corel, *page 57*



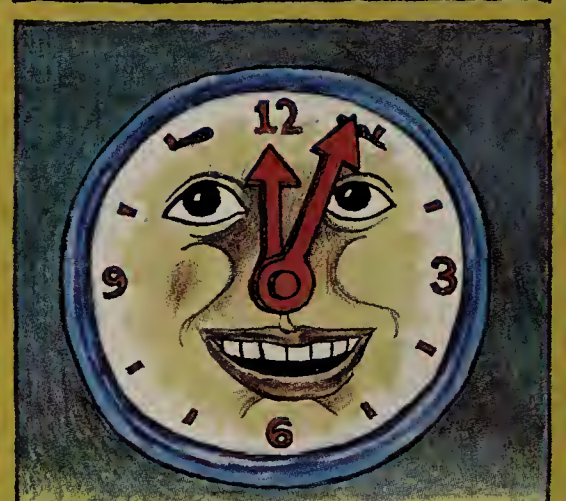
8:30 A.m. MARKETING REQUESTS WEB SITE FOR NEW PRODUCT LINE. (GULP).



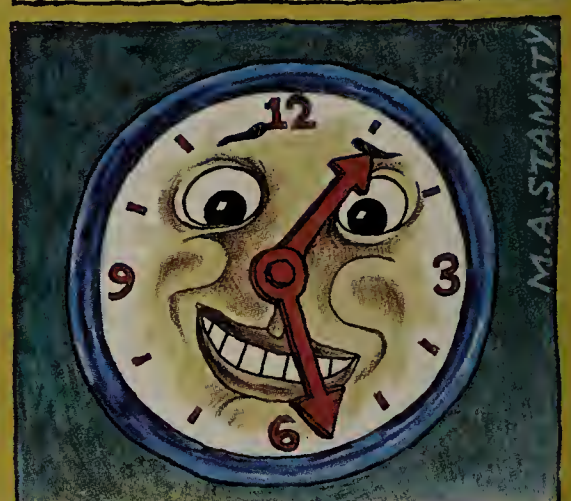
9:05 A.m. 18 PRODUCT DESCRIPTIONS, SWEEPSTAKES ENTRY FORM, CUSTOMER/PROSPECT SURVEYS. ALL DUE NOW. NATURALLY.

10:20 A.m. PHONE RINGS AGAIN. CUSTOMERS SHOULD BE ABLE TO VIEW ALL PRODUCTS. PROSPECTS, ONLY NEW PRODUCTS. ...RIIIIGHT...

11:58 A.m. SEEMS TOO EASY. MUST BE DOING SOMETHING WRONG. PHONE RINGS AGAIN. CAN YOU SET UP A DISCUSSION FORUM, TOO?

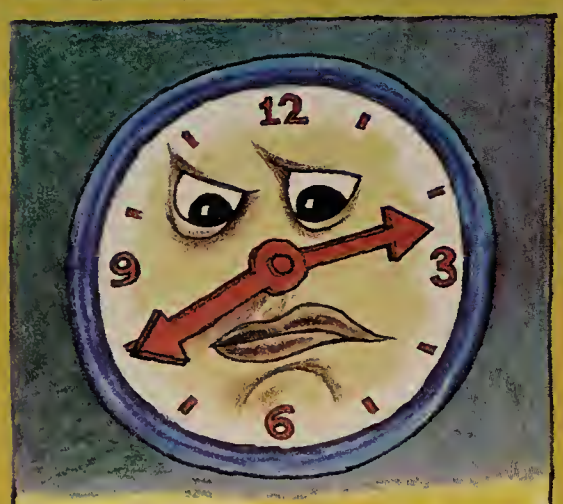


12:03 P.m. FRIENDS ASK if YOU HAVE time FOR LUNCH. TO YOUR SURPRISE, YOU SAY YES.

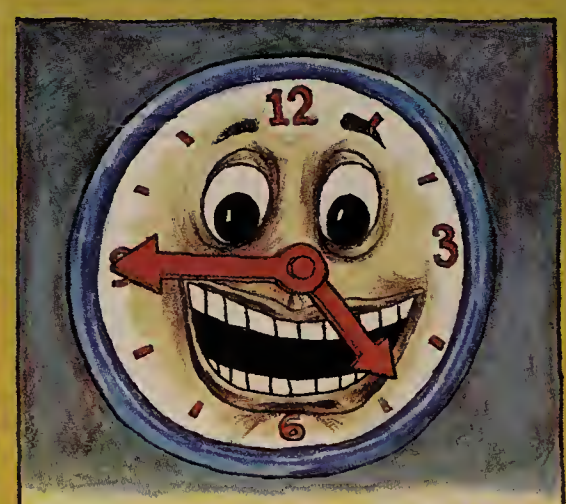


1:29 P.m. YOU ACTUALLY HAVE time TO ADD COOL ANIMATION. DROP IN JAVA APPLET.

M.A.STAMATY



2:40 P.m. CONTENT STILL NEEDS TO GO THROUGH APPROVAL CYCLE. SKEPTICISM SETS in BIG TIME.



4:45 P.m. It's UP. It's RUNNING. DISBELIEVING CO-WORKERS STAND in AWE.

5:40 P.m. LEAVE WORK ON TIME. FEELING GUILTY. TERRIBLY GUILTY.

NOW YOU CAN CREATE INTERACTIVE BUSINESS APPLICATIONS AND PUT THEM ON THE WEB IN A DAY. YEAH, WE DIDN'T BELIEVE IT AT FIRST, EITHER.

Hard to believe, but true nonetheless. What used to take days now takes only a single day.

Domino™ is the new interactive web application server designed to make your life easier.

Yes, you *can* create a whole website in a day. That's because Domino includes Domino.Action.™ Just point and click and your website is up without knowing HTML, CGI, or other complex web tools.

And there is automated distributed authoring to easily manage input and approvals from your website content providers. Without coding! You can even set up access control quickly and easily, ensuring that only designated users have access to sensitive business information.

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And you get built-in forms design with reusable elements, so you don't have to create every form from scratch.

And best of all, Domino is built on the world's most powerful platform for business applications: Lotus Notes.®

For more information, visit our website at http://domino.lotus.com. We'll show you how Domino can make the easy things simpler and the hard things possible. Believe it.

Domino

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Lotus

Working Together

Now that we're officially the new kid on the block, we thought you'd like to see our new bottom line.

Now through February 28th, we'll match our competitors' best access server price* and give you double the ports... no ifs, ands, or buts.

Introducing Two-for-One Port Pricing... Only From Access Beyond.

Presenting Access Beyond, a bold new company with extraordinary products and fresh network strategies. And to celebrate our birth, for a limited time, Access Beyond will match any Shiva, Cisco or Bay access server price* and double the number of ports... guaranteed. They say four, we give you eight. They give you eight, we give you sixteen. Same price, twice the ports. That's the bottom line.

And what's even more revealing, Access Beyond's Servers combine more features, more performance and ease of use with exceptional security and management to deliver maximum capabilities at twice the value.

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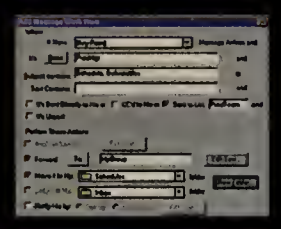
So why settle for half the access for the same bottom dollar? There are no gimmicks, no risks. Just better performance, better features, and twice the ports. And if you're not completely satisfied, just return it within 30 days for a complete refund. No ifs, ands...or buts.

For the details on Access Beyond's Two-for-One Port Program, call (800) 456-7844, ext. 8801. We'll be glad to give you all the bare facts.

United Kingdom: Access Beyond, Ltd., 5 Stable Court, Herriard Park Estate, Herriard, Basingstoke, Hampshire RG25 2PL, United Kingdom, Phone: (44) 1256 381800, Fax: (44) 1256 381884

*Does not apply to promotions, giveaways or special pricing. Please call for details

BANYAN'S INTELLIGENT MOVE



Banyan has ported its Intelligent Messaging service for Windows NT Server. Page 29.

AFFORDABLE ATM

Columnist Tom Nolle says 3Com, with its aggressive pricing, is a sleeper in the ATM game. Page 39.

GETTING THE PICTURE

First Virtual and PictureTel partner to deliver desktop video over 25M bit/sec ATM links. Page 25.

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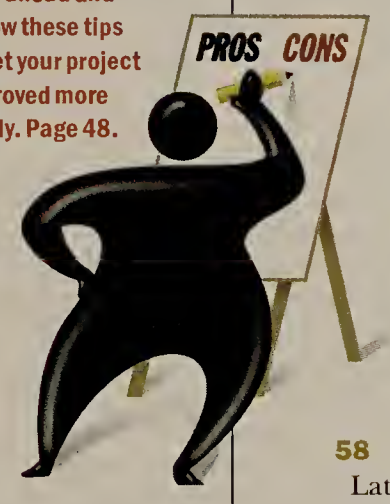
Plan ahead and follow these tips to get your project approved more easily. Page 48.



FEATURES

Global virtual nets: Buyer beware. *A guide to the global net service consortiums.* ***Page 41.***

Server Review Series: *Enterprise entries from Acer, Digital, HP and Land-5.* ***Page 44.***

FIND IT @ FUSION

To quickly get to any online info referenced in *Network World,* type its DocFinder number in the input box on the home page.

This Week

Only on Fusion

- **Connecting peripherals across the wide area?** Two vendor consortiums are working on rival proposals — one using telephony-based fax standards, the other Sun's RPC. Read up on the proposals and follow links for more info. **DocFinder: 5105.**

News+

- **High-speed switching:** See just how IBM proposes to compete with Cisco's Tag Switching and Ipsilon's IP Switching. Grab a copy of IBM's detailed Aggregate Route-Based IP Switching proposal to the Internet Engineering Task Force. **DocFinder:5111**
- **Gigabit Ethernet:** Some Gigabit Ethernet start-ups are so new they don't even have Web pages yet. But take a look at the offerings from those that do, and grab some primers on this upcoming technology. **DocFinder: 5110.**
- **Java/relational databases:** See how some companies are working to give Web browsers access to SQL databases. **DocFinder: 5112.**
- **Java:** See why one start-up says it won't use the Java Virtual Machine in its Internet-based applications. **DocFinder: 5109.**
- **IP address management:** Download papers and primers on managing large numbers of IP addresses, such as an overview of the Dynamic Host Configuration Protocol and issues related to router loads. **DocFinder: 5101.**
- **Web browsers:** Read our article on Web-enabling dumb terminals (page 33), then go online to get more info on Lynx, the granddaddy of all text-based Web browsers. **DocFinder: 5103.**

NetRef

- **Server Test Series:** Download test results, in Excel spreadsheets, for the four servers we discuss this month on page 44. **DocFinder: 1028.**

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How to contact us

WRITE: Network World, 161 Worcester Road, Framingham, MA 01701. **CALL:** (508) 875-6400; **FAX:** (508) 820-3467; **E-MAIL:** nwnews@nww.com

News briefs, November 25, 1996

Oracle jumping off Bandwagon

Oracle Corp. has pulled the plug on developing a bundle of software applications designed to compete with Microsoft Corp.'s BackOffice, according to an IDG News Service report based on a source close to Oracle. Code-named Bandwagon, the bundle would have included Oracle's InterOffice groupware, Oracle7 database, WebServer and Enterprise Manager. "The market has been moving very quickly toward the Internet, and we decided to focus on [this] right now," the source said. "We felt we were well covered with [our individual applications] in competing with BackOffice; they don't need to be bundled all together."

Bellcore gets bought

Forced by looming competition to free themselves from entanglements with one another, the regional Bell operating companies last week sold off Bellcore, their shared software development and systems integration subsidiary. A surprising suitor, Science Applications International Corp., which also owns Internet domain registration firm Network Solutions, Inc., put down an unconfirmed $700 million for Bellcore. The sale is expected to be complete sometime next year.

IBM plays it safe

IBM and Teloquent Communications Corp., a maker of software-based call distribution systems, today will announce a deal to outfit IBM's customer disaster recovery centers with Teloquent systems. Teloquent software running on industry-standard server platforms takes 800 and other calls and assigns them to call center agents without the need for a PBX or automatic call distributor (ACD). By installing the system, call center administrators will gain a new backup system in case of PBX or ACD failure, natural disaster or other disruptions.

Bells' complaints ring hollow to some

Regional Bell operating companies got slammed on two fronts last week for their recent warnings that the growth of Internet access requests is causing congestion on the telephone companies' local switches:

- MCI Communications Corp. released a report charging that the RBOC warnings are a scare tactic meant to get regulators to impose access fees on Internet service providers. MCI pointed out that several vendors now offer central office switch adjuncts that segregate Internet access traffic from other traffic.
- The chief executive officers of America Online, Inc., CompuServe, Inc., Prodigy Services Corp. and PSINet, Inc. urged the Federal Communications Commission to "proceed cautiously in drawing conclusions from the RBOC claims." In a joint letter to FCC Chairman Reed Hundt, the executives said forcing ISPs to pay access fees could damage the industry because "subscribers to Internet and online services are very price-sensitive." The CEOs pointedly added that RBOCs are boosting their profits via additional home and business lines installed specifically for computer-network access.

I/O, I/O, it's off to work we go

Some two dozen vendors last week used Comdex/Fall '96 to demonstrate the performance and manageability advantages to be gained by supporting I2O, an increasingly popular specification for improving the way servers handle I/O. Announced in January, the I2O architecture makes it possible for servers to off-load device drivers to intelligent I/O processors, speeding up overall server I/O. Novell, Inc., Microsoft Corp. and 3Com Corp. were among the demonstration participants. Additionally, this frees up the main processor to handle high-bandwidth applications such as networked video, groupware and Web transactions.

AT&T adds data to voice service

By Denise Pappalardo
Bedminster, N.J.

AT&T is giving its virtual private network service a face-lift by integrating its Software Defined Network (SDN) and Global ISDN platforms. The result? Enhanced network management capabilities for AT&T's switched digital services.

AT&T's Davis: *Network upgrades, three years in the making, integrate voice and data for VPN users.*

In fact, what was once a voice-only service has become an integrated voice and data service. The combined platforms let network managers change their ISDN users, access privileges, change their calling features and monitor traffic from one site using a single management interface. No longer will network managers contact their AT&T representative every time they want to tweak their network.

AT&T has offered its SDN virtual private network service since 1986, mainly for voice traffic. "This is the first time AT&T is offering complete data integration from a local exchange provider," said Will Davis, Global ISDN product manager at AT&T.

Through network control point software upgrades, AT&T can now interface between its virtual private network services — including SDN, Virtual Telecommunications Network Solutions and OneNet networks — and a local exchange provider's Basic Rate Interface ISDN network.

The upgraded network control points let the interexchange carrier integrate customers' long-distance ISDN calls into the same bill as their existing virtual private network service.

Customer Direct is a Microsoft Corp. Windows-based application that can run on Novell, Inc.'s NetWare 3.X and 4.1, as well as on Windows NT LANs.

"The advantage of integrating the two services onto one platform is it lets us leverage our total spending on technology and operations," said Linda Tratnick, network manager at a Cleveland-based Fortune 500 manufacturing company. "Right now, the services are under separate contract agreements and are billed individually," she added.

"You can't underestimate the importance of unified billing," said Kieran Taylor, broadband consultant at TeleChoice, Inc. in Verona, N.J.

"To date, most service providers have separate billing and monitoring that places the customer at a disadvantage," he said.

SDN users that currently have voice contracts with AT&T can add switched digital ISDN BRI services to their contracts. This may result in a higher percentage of discounts according to call volume.

While both MCI Communications Corp. and Sprint Corp. offer combined billing minutes, AT&T's overall package is better, said Melodie Reagan, director of local and long-distance services at TeleChoice.

"AT&T has extended its SDN service in a nice, easy-to-understand package where other carriers' packages get convoluted," Reagan said. She also pointed out that the other carriers' monitoring features are not as tightly integrated as AT&T's. ■

PacBell speeds up ISDN ordering

By Tim Greene
San Francisco

Pacific Bell last week announced a service that lets companies give telecommuters ISDN access without having to install it or rely on the end user to do so.

Home Pack is the most comprehensive offering from any regional Bell operating company for setting up an ISDN line. For end users, setup has long been the most aggravating aspect of the digital service.

With the package, the customer gets a 128K bit/sec ISDN line, a 3Com Corp. terminal adapter, and Internet access and installation for $554 less and a $50 rebate on the terminal adapter.

Some RBOCs market ISDN lines through equipment vendors, but none of the others offer a package that includes gear and installation.

Bob Larribeau, director of the California ISDN Users Group, said the deal is one that Pacific Bell is uniquely suited to offer in California. Others would be hard-pressed to offer such a service with a low-cost terminal adapter and make a profit. "This is addressing ISDN as a mass market," he said.

Pacific Bell even acknowledged the hassle customers faced when they called to order an ISDN line. "We'd actually have to say, 'Well, no, do you have equipment?' and users would say, 'What equipment?'" said Tom Bayless, Pacific Bell's director of switched digital services.

Under the program, users requesting ISDN service will get a call back from Pacific Bell within 24 hours to schedule installation. If an existing line is in good condition and close enough to a central office, the service can be turned up within seven days. Otherwise, it can take as long as 14 days, Bayless said.

✆Pacific Bell: (800) 472-4736.

Access offers two-for-ones

By Tim Greene
Gaithersburg, Md.

Access Beyond, Inc. is trying to become more than just a blip on the remote access radar screen with an in-your-face play to lure users away from three heavyweights in the field: Bay Networks, Inc., Cisco Systems, Inc. and Shiva Corp.

Through the end of February, Access Beyond will meet the prices of certain rival gear, but will give the buyer an Access Beyond device with twice the number of ports as the competition offers.

It is an attempt to make a splash with the launch of the company's modular product line it announced last January, but which has been delayed. President Ron Howard said spinning the company off from Penril Datability Networks stalled things for a while, but the organization is getting back on track.

Access Beyond devices are fully modular, with the AB1000, AB2400, AB4400 and RAM Rack all included in the Double the Ports program.

Asynchronous and 33.6K bit/sec modules are available now, and a Basic Rate Interface ISDN module is scheduled for release in early 1997. Later next year, T-1 and Primary Rate Interface ISDN modules will be available.

✆Access Beyond: (800) 456-7844; http://www.accessbeyond.com.

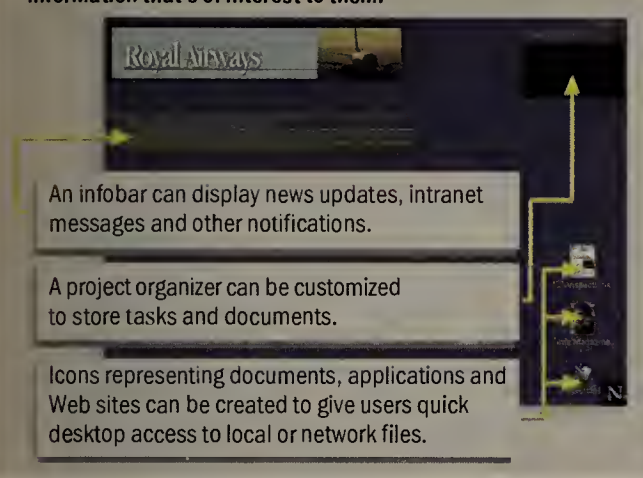
Netscape configures Constellation

By Carol Sliwa
Las Vegas

Netscape Communications Corp. has not even launched a beta version of the Communicator groupware client it announced last month, yet the company is already talking about new features.

NETSCAPE'S CONSTELLATION

Constellation's "homeport" gives end users access to information that's of interest to them.



Last week at Comdex/Fall '96 here, Netscape Chief Executive Officer Jim Barksdale unveiled a new component, code-named Constellation, that will let end users customize their desktops based on information "pushed" there from the 'Net or local servers or hard drives.

An end user sets up a "homeport" that can contain desktop applications, Web sites, HTML pages and text documents stored on local servers. Constelllation can also be configured to have information from Web sites broadcasted to their desktops. And when end users are on the road, they can gain access to the same desktop workspace they view when in the office.

"[Constellation] serves a need that hasn't been served so far: a greatly simplified user interface for information that's on the 'Net and local," said Mike Homer, Netscape's senior vice president of marketing. "The basic user interface hasn't been redesigned for 12 years on the PC."

Netscape is hardly the only company instigating a change. Rival Microsoft Corp. this year announced an Active Desktop that will allow users to browse the Web and their local files through a common interface.

The major difference between the two offerings is that Netscape's is cross-platform and Microsoft's is targeted at Windows environments.

"[Constellation] is clearly positioned against Active Desktop, and it's a good comeback," said Rob Enderle, an analyst with Giga Information Group. "I'm just not convinced the Unix or the Mac guys feel they'll need another. In the Windows environment, where it could play, Microsoft's locked that up."

Because Microsoft is building in the browser as the front end of the operating system with its next release of Internet Explorer, there won't be a need for another browser, Enderle said.

"Netscape is trying to take over the screen and relegate Windows to an icon," said David Smith, research director of Internet strategies for Gartner Group, Inc. "Microsoft will take that as a slap in the face." Microsoft officials have long been interpreting Netscape directives as an affront to their Windows operating system. But Netscape insists Constellation is no attempt to replace Windows.

Netscape already is working with two partners in its Constellation effort: Marimba, Inc. and PointCast, Inc.

Constellation is expected to be available in the first half of next year.

©Netscape: (415) 937-2555.

PeopleSoft dresses up apps in Tuxedo

By John Cox
London

PeopleSoft, Inc. last week unveiled the latest version of its client/server human resources and financial applications, and started shipping its new manufacturing applications.

PeopleSoft 6.0, the umbrella label for the applications, differs from previous editions largely because the applications incorporate the Tuxedo transaction processing and messaging middleware from BEA Systems, Inc.

Via Tuxedo, customers can distribute or partition application logic, processing and data among clients, application servers and databases at multiple sites. Until

See **PeopleSoft,** *page 11*

'Net Buzz

The latest on the Internet/intranet industry.

By Chris Nerney

News and notes from last week's Comdex/Fall '96 trade show in Las Vegas.

AT YOUR BECK AND CALL CompassWare Development, Inc. announced plans to release next week a software package called InfoMagnet, the latest product that promises to retrieve personalized information from Web sources and internal corporate databases.

Given the success of the PointCast Network this year, personalized information retrieval has become one of the busiest Internet-related cottage industries. Other companies with info-retrieval products include BackWeb Technologies and AirMedia Live.

CompassWare, a 3-year-old company based in New York, is targeting InfoMagnet exclusively at the corporate intranet market.

HOT NEW NAME Look for LinkStar Communications, Inc. of Boca Raton, Fla., to change its name this week to HotOffice Technologies. LinkStar's flagship product is HotOffice, billed as a secure, private Internet-based office – an "extranet," in current parlance – that offers access to communications, productivity, publishing and business tools for a monthly fee.

Company Chairman Stewart Padveen said "the new name will help promote our brand equity." A company representative at Comdex put it another way: "HotOffice just sounds cooler."

WAKE US WHEN IT'S OVER Making a disappointing debut was Comdex Venture Outlook, which suffered from sparse attendance and somnambulistic moderators. It also didn't help that the Internet-oriented venture capital conference was located at the Flamingo Hilton, far from the Las Vegas Convention Center where most of the action was.

WE ALWAYS APPRECIATE A PLUG Seen on the sides of the blue cardboard boxes handed out by IBM to thousands of show attendees: "Wouldn't it be nice to be a part of the buzz instead of just hearing about it?"

Consider your wish granted, Big Blue.

AMWAY MEETS THE INTERNET FutureNet Online, Inc. markets a computer terminal designed to connect to the Internet through your TV. However, representatives of the Valencia, Calif.-based multilevel marketing company weren't at Comdex to find mere customers. They were looking for distributors to sell the Baby Bear set-top computer, visionaries prepared to cash in on the "Number One Financial Opportunity Ever!"

And here we were, ready to settle for a free T-shirt.

YES, BUT WHAT'S THE WORD FOR 'PARADIGM SHIFT'? Give Aimtech Corp. of Nashua, N.H., the Most Esoteric Inspiration Award. The company's multimedia Java authoring tool is called "Jamba," which an Aimtech presenter said means "to celebrate life" in Swahili.

MAYBE THEY THOUGHT THEY WERE AT "ADULT-DEX" The Most Shameless Use of Cleavage Award goes to Westminster, Calif.-based Technology Guardian, Inc., which touted – among other things, judging by the models in its booth – satellite access to the Internet.

Why schlep to some desert gambling mecca to unveil your latest Internet and intranet news when you can tell the world through 'Net Buzz? Contact Chris Nerney at cnerney@nww.com or (508) 820-7451. Guaranteed 96.7% payout.

Proginet in talks to bolster BackOffice

By Christine Burns

Redmond, Wash.

Microsoft Corp. and Proginet Corp. are working on a deal that will help give Microsoft's BackOffice applications stronger ties to information stored on legacy host systems.

The efforts are expected to make it easier for customers to access back-end data via Microsoft's NT Server applications, such as Exchange and SQL Server, by using Proginet's HostOffice tools (see graphic).

Microsoft's SNA Server, one member of the BackOffice family, already provides direct access from Windows NT Server nets to mainframes and IBM Application System/400 systems.

"SNA Server does most everything that our customers have asked for in terms of LAN-to-host connectivity," said Mike Nash, director of server marketing at Microsoft. "But we are always looking for ways to make those connections more useful in specialized applications."

Nash declined to give details about content or timing regarding a deal with Proginet, as did Proginet officials. But Nash confirmed that Microsoft is discussing the possibility of using pieces of Proginet's HostOffice software suite to increase its host connectivity services within BackOffice.

Analysts expect customers to welcome any improvements.

"Administrators today are more comfortable with giving users access to NT applications than they are with opening up their mainframes, especially over the Web," said Rob Enderle, an analyst with Giga Information Group in Santa Clara, Calif. "NT tools that push mainframe data out there without disrupting the traditional security can only help push NT further into that enterprise market."

BackOffice is a family of integrated Windows NT Server-based applications comprising groupware, host connectivity, database, desktop management and Web services that all share a common security and management infrastructure. The popularity of the suite is growing fast, with financial analysts predicting sales will top $1.8 billion in Microsoft's 1997 fiscal year.

The Proginet HostOffice suite comprises data transfer, security, Web publishing and management tools.■

Proginet's HostOffice suite

These tools link Microsoft's BackOffice applications with legacy systems.

HostOffice component	BackOffice component it works with	What HostOffice component does
Fusion FTMS	Windows NT	Distributes large volumes of legacy data.
SecurPass	SNA Server	Integrates host and NT security.
TransAccess	Internet Information Server	Handles host-to-Web publishing of CICS applications.
SQL Data Loader	SQL Server	Loads mainframe and AS/400 data to Microsoft databases.
HostFolder	Exchange Server	Allows host data to be stored in Exchange public folders.
Automator	Windows NT	Ties automated host operating with unattended NT processes.

NetFRAME puts on intranet face

By John Robinson

Milpitas, Calif.

NetFRAME Systems, Inc. is cooking up a Windows NT-based hardware/software bundle designed to ease the setup and maintenance of corporate intranets.

The NF9000 Intranet Server (NF9000is), expected for release in early December, is a Pentium Pro system that comes with NetFRAME's Ready, Intranet, Go development software.

The NF9000 machine is NetFRAME's first to support standard I/O devices. Previous servers, with proprietary I/O support, prevented customers from using standard PCI cards and storage systems.

NetFRAME's Ready, Intranet, Go software suite eases the creation and management of corporate intranets. The suite includes Site Architect, a Web creation tool; Design Center, a Web publishing utility; and the Help Desk tool set. The package should include additional intranet applications, sources said.

The offering is not NetFRAME's first intranet server bundle. In August, the company packaged Ready, Intranet, Go with its ClusterServer 8560.

Analysts expect the new bundle will contain many of the same applications as the 8560 package, which included Microsoft Corp.'s Internet Information Server (IIS), FrontPage authoring and Web site management software, and Access database, as well as the Excite search engine.

In addition to the intranet software, the NF9000is' triple-bus architecture should pique customers' interest. Systems with two buses traditionally put all the slow devices — like a keyboard — on one bus, and high-speed devices — such as a Fast Ethernet network interface card — on the other. NetFRAME's architecture lets the high-speed devices be split between two buses in a failover configuration.

Pricing for the intranet bundle was not available. However, a basic NF9000 configuration of one CPU with 64M bytes of memory and four PCI slots is priced at $25,000. A fully loaded rack with 20 drives, 16 slots and four-way symmetric multiprocessing is priced at about $130,000.

©NetFRAME: (408) 474-1000.

Intranet performance pack

NetFRAME's NF9000is, based on the Cluster System 9000 shown here, is designed to ease implementation of corporate intranets.

Server: Pentium Pro-based SMP system running Windows NT

Software: Ready, Intranet, Go, which includes the Site Architect development tool, Design Center publishing utility and Help Desk tools

The Internet product

Lotus outlines electronic commerce, Java plans

Domino.Merchant product to facilitate electronic trading.

By Ron Condon
Las Vegas

COMDEX

Lotus Development Corp. is aiming to reduce the cost of entry into the world of Internet trading with the launch of tools to manage handling Web-based transactions.

Central to the new offering, and designed to integrate the selling process into the rest of the business, is Domino.Merchant, which will work with Lotus' Domino Web server and other Notes-based tools. The product was introduced here at Comdex/Fall '96.

Separately, Lotus revealed plans for a new range of interactive Web-based business applications based on the Java language.

As for Domino.Merchant, it improves on similar offerings from Netscape Communications Corp. and Microsoft Corp. by managing the whole sales cycle, according to Keith McCall, director of Lotus' Internet applications unit. The product lets companies take an order, authorize credit, analyze sales trends and make follow-up calls, he said.

"It is an integrated solution rather than a bucket of parts," McCall added.

The product, which is expected to be available in January, will sell for less than $5,000, McCall said.

"It will allow a company to create a commercial Web site for under $10,000, including the hardware," he said.

The pricing will enable small businesses, such as hairdressing salons and restaurants, to advertise on the World-Wide Web and take reservations by using the Domino calendaring facility.

Lotus also plans to make a version that will be hosted by Internet service providers and can be rented by companies with limited technical expertise.

Domino.Merchant works in association with Domino.Action, a Web site design tool, which is due to ship with Notes 4.5 in December. The product provides templates to simplify the creation of home pages and product specifications. Its workflow features also allow Web site content to be created by authorized users in multiple departments.

In addition, Lotus has created a tool that will allow companies to broadcast information to select users over a corporate intranet. Called Domino.Broadcast for PointCast, it is still in beta test with 20 companies, McCall said.

Major Java project

Lotus will further improve the ability of its software to work over the Internet via new Java-based offerings.

Lotus and parent company IBM have assigned a group of 300 to 400 engineers to one of the world's largest Java-based development efforts, Lotus President Jeff Papows said. The fruit of this program, due to appear sometime next year, will be a set of cross-platform applets called Lotus Components for the Internet, which users will be able to access from a Notes client or an Internet browser.

Domino.Merchant manages the whole sales cycle by letting companies take an order, authorize credit, analyze sales trends and make follow-up calls, McCall said.

The program is an extension of Lotus Components, released in August, and is one element of a two-part strategy that lets users access the Internet either from their SmartSuite applications or from a Web browser.

To provide access to the conventional end user, Lotus launched here SmartSuite 97, an update of its suite of business productivity tools. SmartSuite 97 makes it easier to incorporate information taken from the Internet, and also to publish corporate documents, spreadsheets, presentations, databases and calendars on a corporate Website.

Papows declined to give full details of Lotus Components for the Internet, saying that more information will be available in January at the Lotusphere conferences in Orlando, Fla., and Nice, France.

But he said the components will offer a new range of interactive Web applications, not just building blocks for others to put together. ■

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PeopleSoft

Continued from page 7

now, PeopleSoft relied on a large and powerful client program talking directly to a database, where the heavy-duty processing was performed.

What's new in PeopleSoft 6.0 applications?

- Integration of BEA Systems' Tuxedo transaction processing and messaging middleware
- Web access to database
- Global features such as Value-Added Tax processing
- Support for foreign languages
- Applications such as Pension Administration
- Manufacturing suite
- Functions such as bank reconciliation and load planning

This new type of application architecture is vital as PeopleSoft aims at Fortune 1,000 companies operating in many nations.

The use of Tuxedo's messaging middleware, coupled with distributed business logic and data, should let customers create a flexible, resilient and global PeopleSoft network.

One component of the manufacturing applications — built-in workflow technology — should prove especially helpful to discrete manufacturers looking to extend PeopleSoft applications across networks.

In addition, the company will add a real-time planning and scheduling system and a product configuration system to the applications. Both additions are now being beta-tested.

PeopleSoft also announced, as part of its PeopleSoft 6.0 launch:

- Its first non-English versions.
- Graphical tools for designing and navigating business process models.
- Integration of third-party Web products to let users with Web browsers access PeopleSoft applications and databases.
- Eleven new applications, in beta or due for general release next month.
- Upcoming packages aimed at colleges and universities, and state, local and federal governments.

PeopleSoft 6.0, with new releases of the Financials, Human Resources and Distribution suites, will be available in December. Multilanguage versions will ship during the first half of 1997.

Pricing starts at $100,000 per application.

✆PeopleSoft: (510) 225-3000.

Microsoft perks up Netscape browsers

By Carol Sliwa
Las Vegas

Microsoft Corp. last week announced a plug-in version of its Java Virtual Machine (JVM) that will run in Windows-based Web browsers made by rival Netscape Communications Corp.

More info is brewing online:

- **A copy of the JVM spec**
- **Microsoft papers on integrating Java and ActiveX**
- **One start-up's explanation of why it won't use the JVM in its Internet-based apps**

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Upon introducing the module, Microsoft produced a list of nine Java developers who professed to gain better performance with Microsoft's virtual machine than with Netscape's. Virtual machines interpret Java and run Java applets.

It was a "nightmare" to get some applications to run on Netscape's virtual machine for Windows 95, said Patrick Connolly, president of Ethos Corp., which showcases its work through its InvestorsEdge Web site. But they ran fine in the Microsoft environment, he said.

Using Microsoft's JVM in Netscape browsers will mean developers have to write to the Microsoft JVM explicitly, said Danny Shader, Netscape's vice president of industry and developer relations.

"That defeats the purpose of Java. The idea of Java, and why it's so appealing, is that you write once and run anywhere," he said.

But analysts said that is not the way it is working in all cases.

"Developers are starting to run into all sorts of incompatibilities between the various Java virtual machines," said John Rymer, an analyst with Giga Information Group. "Microsoft's making a preemptive strike."

Microsoft's JVM plug-in, which will run only on Netscape Navigator for Windows NT and Windows 95, can be downloaded free from Microsoft's Web site later this month. ■

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AT&T

IBM

Continued from page 1

Sources said IBM's technology could appear in products such as the 8260 hub late next year. Boivie declined to provide product delivery information.

IBM joins Ipsilon Networks, Inc. and Cisco Systems, Inc. in the IP switching market, which analysts predict will heat up in the 1997 to 1998 time frame. IP switching is intended to increase the performance of IP internetworking by replacing hop-by-hop routes with cut-through paths.

A head start for Cisco, Ipsilon

But detractors point out Ipsilon and Cisco have a head start gathering multivendor backing of their respective schemes. Ipsilon is the furthest along, with an actual IP switch device and an IETF request for comment number already assigned.

On the flip side, Cisco has not delivered any Tag Switching products yet, and Ipsilon does not have a huge installed base, so the market is still wide open, analysts said.

"Cisco's could be tough to overcome because they can get Tag Switching into a ton of routers very quickly if they want," said Don Czubeck, president of Gen2 Ventures, a consultancy based in Saratoga, Calif.

"IBM still has to prove itself in the TCP/IP environment, where this technology is going to be needed," he added.

The technology IBM describes in its ARIS paper is closer to Cisco's Tag Switching than Ipsilon's IP Switching scheme. For example, ARIS uses routing tables to set up sessions like Tag Switching. It also supports multiple data link types, such as Tag Switching.

But Boivie said ARIS differs from Tag Switching in the number of ATM Virtual Channels it needed to establish switched paths through the net, making it theoretically more scalable than Tag Switching or IP switching.

Boivie noted that IBM's goal is to drive a common standard for IP switching, not get into a battle over who has the best switching technology.

That is also Cisco's goal, according to Cisco officials.

"This is what we want to do in the first place — encourage people to bring their own ideas to the IETF so we can all get together and talk about it and hopefully combine the best of these into a common specification," said Anthony Alles, director of ATM product marketing for Cisco. "I see Tag Switching and ARIS and Ipsilon and Cell Switch Routing from Toshiba — all of these are essentially first-cut solutions to the same problem."

Alles said he could foresee IBM and Cisco working together to improve quality-of-service issues.

"What we can also do is use a mechanism like [Resource Reservation Protocol] to allocate tags to the particular flows that need quality of service," Alles said. "In either [ARIS or Tag Switching], that's a fairly straightforward thing to do, and I think that's certainly the area where we'll probably work together."

But Alles added that each IP switching proposal to date needs to better address multicast operation, whereby a single packet is replicated to a subset of network addresses.

"We all have to do more work in areas like multicast support," he said. "That's the area where we're going to see a lot more discussion in the future."

Ipsilon declined to comment on IBM's ARIS proposal. Observers pointed out that ARIS is similar to Ipsilon's Flow Management Protocol, but ARIS addresses the core of the Internet, while Ipsilon's IP Switching, for now, is targeted at corporate campus networks. ■

COMPARATIVELY SPEAKING

Company	Data links supported	Protocol	TCP/IP mapping method	QoS	Multiprotocol support
Cisco	ATM frame relay	Tag Distribution Protocol	Topology	Yes	Yes (IP, IPX)
IBM	ATM frame relay	Aggregate Route-Based IP Switching	Topology	No	Yes (IP, IPX)
Ipsilon	ATM	Flow Management Protocol	Traffic	Yes	No

Security scheme changes with government winds

By Ellen Messmer
Washington, D.C.

Hewlett-Packard Co., joined by Microsoft Corp. and Intel Corp., last week said they've come up with technology that lets users flexibly select encryption algorithms and strength based on government-approved guidelines.

IBM's Kincaid *says the PICA group her company formed with Nortel wants to create an alternative to Microsoft's complex API set.*

This technology, called the International Cryptography Framework (ICF), can be implemented in any tamper-resistent hardware-based encryption unit, such as a smart card or in a PC.

The ICF-based encryption is activated when the government gives you special software to turn it on according to a particular country's rules.

The U.S., French and British governments, which each have their own rules about encryption, last week gave a general nod to ICF.

HP Chairman, President and Chief Executive Officer Lewis Harris said the ICF technology, which HP will include in its servers and PCs next year, will help multinational corporations cope with complex export rules without having to keep reinvesting in equipment.

"In response to a change in government policy, they can rapidly download new software," said Harris, noting that encryption bit-lengths in ICF modules can be flexibly racketed up or down.

The U.S. government only allows export of 40-bit encryption, which is breakable, while the French government has outlawed encryption in general, except for use by financial institutions.

Microsoft holds the keys

Pradhi Mishra, Microsoft security products manager, said ICF relies on the Microsoft Crypto APIs, now part of Windows NT 4.0, Windows 95 and Internet Explorer.

An application written to work with Microsoft's Crypto APIs has its encryption activated with a Microsoft digital signature.

If the crypto is for export, Microsoft wants to see government export approval paperwork before activating it.

The National Security Agency (NSA) is so interested in Microsoft's APIs that managers there recently said they intend to develop a way to translate between the NSA's own crypto APIs and Microsoft's.

As an alternative to Microsoft's Crypto APIs, IBM and Northern Telecom, Inc. are leading an industry group called the Platform-Independent Cryptography API (PICA).

Kathy Kincaid, director of information technology security programs at IBM, said the PICA group wants to create a higher level API that will be easier for developers to write to than Microsoft's complex API.

The PICA group also wants Microsoft to join, but so far Microsoft has shown little interest. ■

Cisco

Continued from page 1

IBM is trying to protect. For example, MPC will play a key role in linking networks within IBM's Sysplex environment, where mainframes are strapped together to form processing clusters capable of supporting large numbers of distributed applications.

Big Blue has made it no secret that it considers MPC a strategic business advantage for its own channel-attached products, and plans to use it for channel-attaching devices such as front-end processors. MPC is a tactical weapon IBM intends to use to ward off Cisco's data center intrusions with its CIP router.

Cisco's long-term strategy is to play a bigger role in linking enterprise net to IBM mainframes — and the CIP is the key to that strategy.

Cisco sees MPC as a key performance and scalability tool for users and intends to deploy the technology in its CIP — whether IBM blesses it or not.

"What IBM has done with MPC is throw up a smoke screen of confusion and fear. Well, we aren't going to take that anymore," said Nick Francis, director of marketing for Cisco's InterWorks business unit. "There's no black magic with MPC; we've implemented it, and it will be announced in December for our CIP."

How did they do it?

Francis declined to get into the specifics of how Cisco's MPC was built, but he said that all the bells and whistles will be there on Day One.

"We are so confident that in the next few weeks we are going to challenge IBM to a smoke-off of channel-attached products. Then everyone will get a chance to see what's what," Francis said.

IBM's Rick McGee has been adamant about his company not licensing its MultiPath Channel (MPC) technology.

But Nick Francis says Cisco isn't waiting around for IBM on this one; it's implementing MPC whether IBM blesses it or not.

IBM did not comment on the Cisco announcement by press time, but Rick McGee, vice president of strategy and business development for IBM's Networking Hardware Division, said as recently as October that the company would not be licensing MPC technology to any vendors anytime soon (*NW*, Oct. 7, page 86).

Cisco and IBM have been down this smash-mouth competition road before. When Cisco first announced plans for the CIP router, IBM indicated that patents it held could bog CIP in a legal quagmire. The patents described how LAN devices communicate with other network devices, such as controllers and routers. After much chest-pounding between the two firms, no infringements were ever proven.

"MPC is the next-generation channel protocol, and by supporting it, Cisco is once again demonstrating its seriousness about this market," said Anura Guruge, an independent analyst based in New Ipswich, N.H.

"All this patent and legal wrangling will ultimately prove fruitless," he said.

IBM executives deny they use any technology to hobble other vendors in the channel connectivity market, but that notion has a hollow ring to it.

Without MPC, other channel connectivity products — most critically, Cisco's — would not be able to perform or have the throughput capacity of IBM's products.

"IBM uses MPC as a sales tactic to hold users to its proprietary product set," Francis said.

Users would just like to see everyone get along. "We want to see [IBM and Cisco] work together to give us the best products so that we can build the best networks," said Glen Tindal, senior architect with MCI Communications Corp., which is in the process of installing a large CIP-based backbone for its SNA net.

"We have no problem driving them to do that," he said.

Tindal said MPC support is critical to MCI's environment because it promises to provide higher throughput and availability of the company's widespread mainframe-based resources. ■

Dinner

Continued from page 1

Valley eatery, was simple. Unite a handful of Gigabit Ethernet upstarts and supply them with food and drink in exchange for letting us eavesdrop on the conversation — a fast-paced discussion that wound up dancing from how to penetrate the installed base of No. 1 enemy Cisco Systems, Inc. to whether or not they will all be acquired by this time next year.

We invited Prominet Corp.'s Menachem Abraham, Packet Engines, Inc.'s Bernard Daines, StarRidge Networks, Inc.'s Bobby Johnson, Rapid City Communications, Inc.'s Joe Kennedy and Extreme Networks' Gordon Stitt. They all accepted swiftly — and not because they needed a free meal; their companies combined have reined in more than $30 million in venture capital on the promise that the market will grow to $2.9 billion or more by the turn of the century. Rather, they just like to gab about Gigabit Ethernet.

"There's just no compelling reason to use [ATM] cells in the backbone anymore. Gigabit Ethernet is the obvious choice," said Kennedy, raising his voice to be heard above the din around us. We'd asked for an out-of-the-way table so we could tape the conversation to ensure accuracy, but found ourselves seated smack in the middle of the restaurant.

Despite the noise, Stitt heard Kennedy's message and agreed.

"For the first time, we have a consistent desktop-to-backbone LAN technology, which makes internetworking a lot simpler," he said. "In fact, companies like Cisco have survived based on complexity, and now we [Gigabit Ethernet players] will thrive because of simplicity."

The conversation's tone was definitely more friendly in nature than we had hoped for, but that probably should have been anticipated since our guests didn't have much to argue about yet; their products aren't due till next year. But it didn't take a second bottle of Silver Oak Cabernet Sauvignon for them to begin posturing vs. existing network equipment vendors.

"The big guys are doing what I call the wart strategy: Offering 100M bit/sec [Ethernet] switches with a gigabit pipe sticking out of the them," Stitt said. "Smaller players can build higher capacity switches from the ground up that are better designed to support Gigabit Ethernet."

Others pointed out that the larger vendors' customers are ripe for the taking. "I look at the installed base as a potential buyers list," Daines said.

Also, Stitt said that contrary to what Cisco wants the industry to believe, customers are open to deploying products from more than one vendor. "It's total baloney that customers only want to buy from a single vendor," he said. "If that were the case, we wouldn't rely so much on standards for interoperability." Stitt added that no market relies more on standards than the LAN industry.

Johnson said the next generation of routers will be much less expensive than their pricey predecessors.

In fact, Kennedy claimed that many customers aren't very happy with internetworking giant Cisco right now. "Cisco traditionally told people how to solve problems. But now they'll give users any technology they want and are no longer providing leadership to the customer."

The Gigabit Ethernet vendors made clear that theirs is not a routing vs. switching issue, either. Sure, they will supply switches that run 10 times faster than Fast Ethernet switches, but many of them will also tackle routing to ensure that high-speed switches don't overwhelm the WAN.

"There's no question that traditional processor-based routers cannot scale," Abraham said. "But we can't build completely flat networks, so some form of routing will find its way into these switches."

Kennedy concurred. "People will be doing a lot of routing," he said. "Maybe not full-blown routers, but certainly a lot more than just bridges."

In fact, Johnson said the next generation of routers will be much less expensive than their pricey predecessors. "There will be a new class of routers that break from the traditional router pricing model of 10 to 20 times more expensive than a switch," Johnson said.

While the start-ups have big ambitions, we wondered how many of them will get to realize their dreams before getting snatched by a larger company or squeezed out of the market. One Gigabit Ethernet upstart — Andy Bechtolsheim's Granite Systems, Inc. — was already gobbled up recently by Cisco for an amazing $220 million.

"Coming from Centillion [which was acquired by Bay Networks, Inc.], I can tell you that we went to the movies and didn't like the ending," Johnson said, referring to the acquisition route. Like his dinner companions, Johnson claimed that he would much prefer to go public than be acquired. He did, however, admit that anything is for sale for a big enough check.

Abraham insisted that it is possible to go it alone. "There will be some long-term survivors," he said. "And competent small companies will be successful and make their mark in this industry."

But when asked if the group were to meet again in a year what the chances would be that everyone would be with the same company, Kennedy replied: "Negligible." On top of that, he predicted that at least one of the five companies would be acquired.

Kennedy also said that by next year, each surviving vendor would be able to bring five customers along to dinner. To which Johnson, sipping a double espresso, said, "We should have 500 customers."

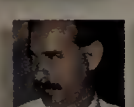
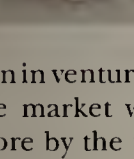
The entire table liked his numbers.

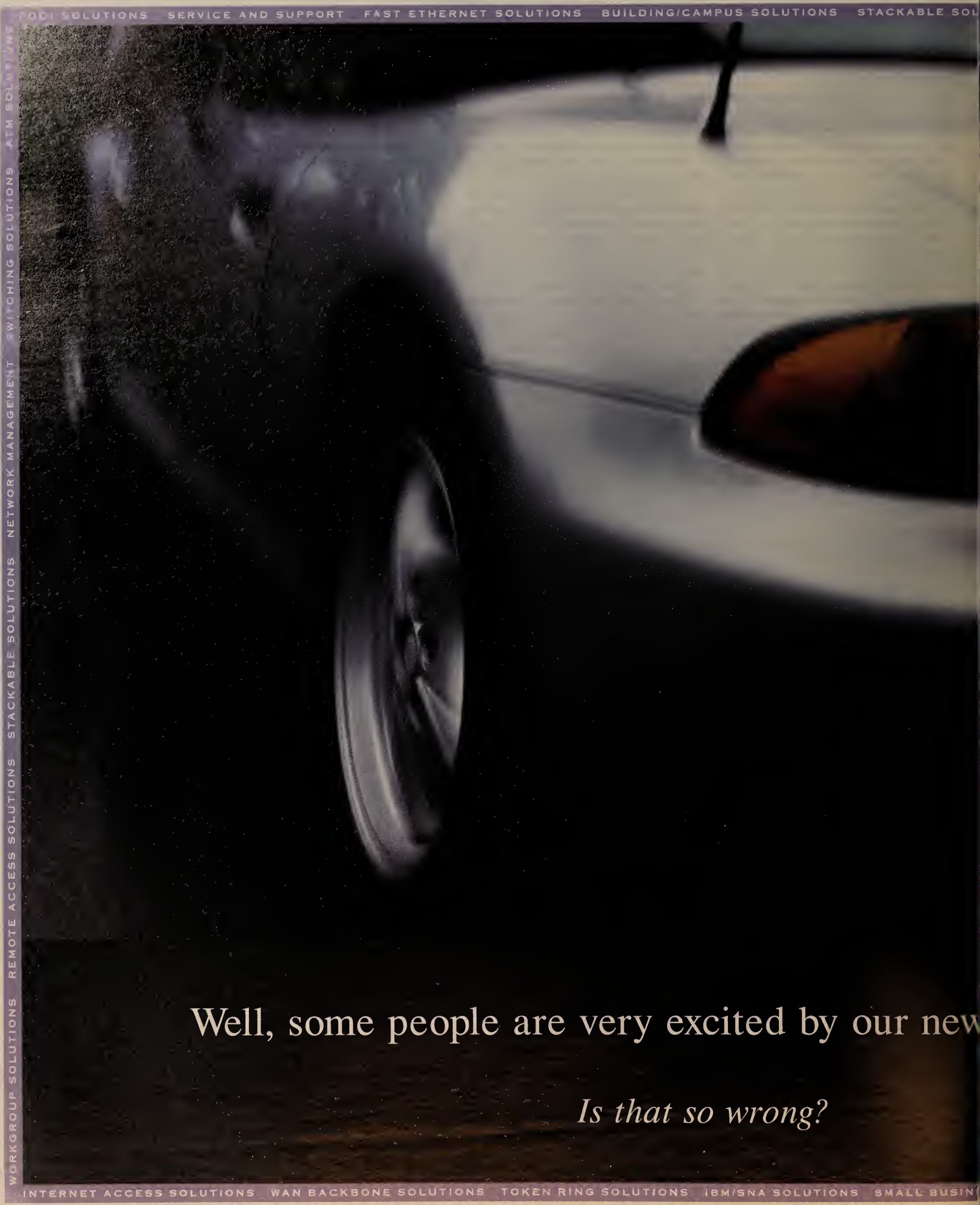
Instead of waiting a year, the group decided that it might make more sense to get together instead at the spring NetWorld+Interop show in Las Vegas. Johnson said that show promises to be the most exciting edition of NetWorld+Interop in five years.

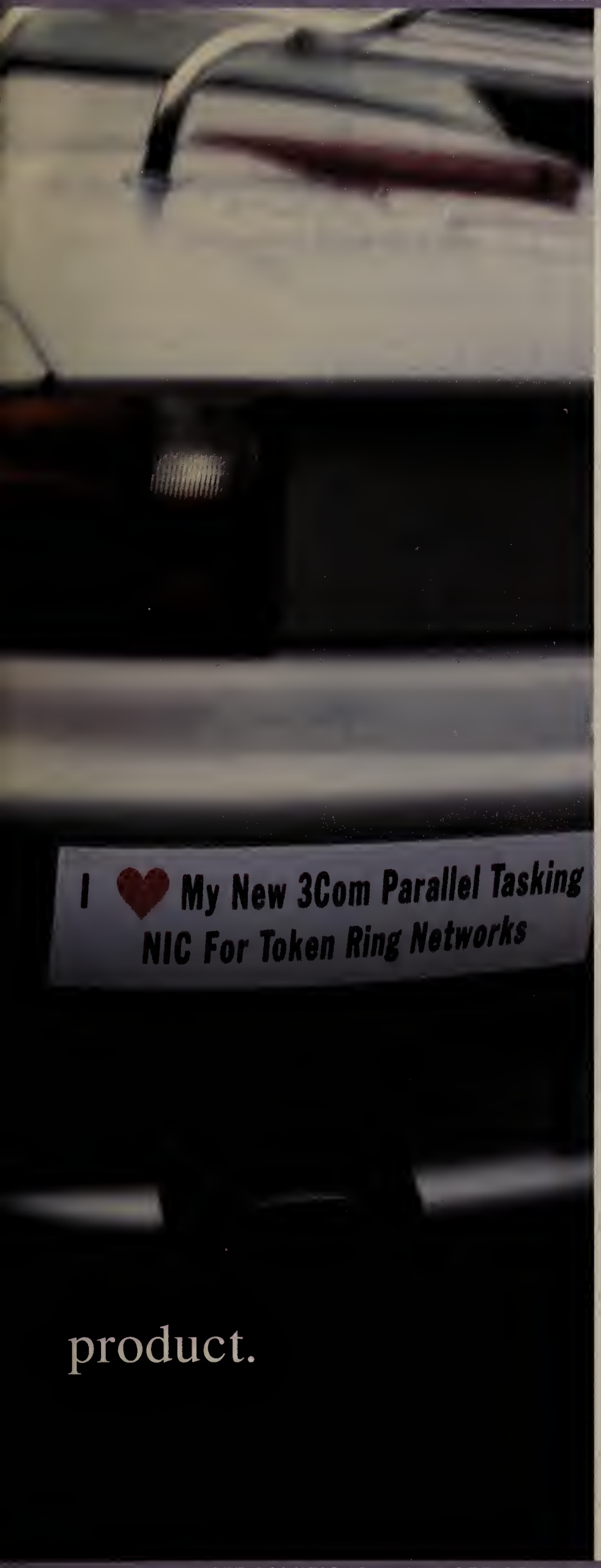
"But maybe we should make it breakfast," Daines said. "Just in case any of us has egg on our face." ■

THE GUEST LIST

Top executives from five Gigabit Ethernet start-ups joined *Network World* last week to discuss the emerging market over dinner and drinks at a favorite restaurant in Santa Clara, Calif.

	Name	Title	Company	Primary products	Former company
	Menachem Abraham	President and CEO	Prominet	Gigabit Ethernet Layer 3 switches	Chipcom
	Bernard Daines	President and CEO	Packet Engines	Gigabit Ethernet switches and buffered repeaters	Grand Junction
	Bobby Johnson	President	StarRidge Networks	Gigabit Ethernet switches with multilayered routing	Centillion
	Joe Kennedy	President and CEO	Rapid City Communications	Gigabit Ethernet switches with built-in routing	Hughes LAN Systems
	Gordon Stitt	President and CEO	Extreme Networks	High-capacity Gigabit Ethernet switches	Network Peripherals





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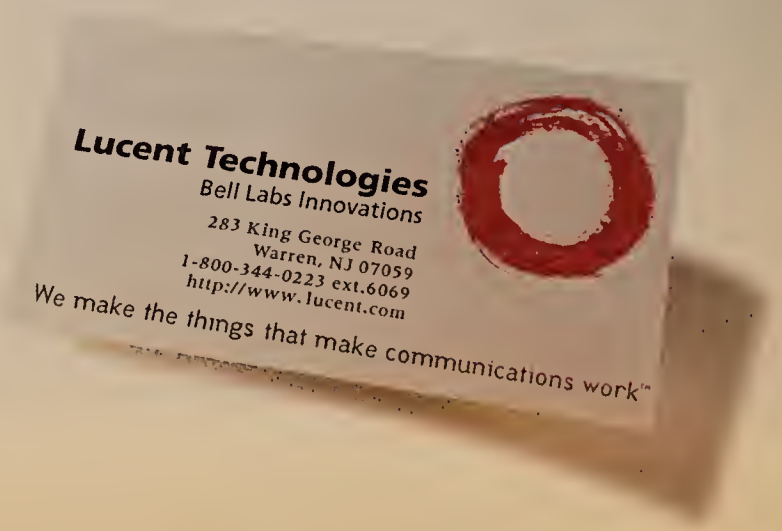


WANs & Internetworking

Covering: Network Architectures and Management • Routers • Muxes, Remote Access Gear, Modems, PBXs and other CPE • Mobile Computing Products

Briefs

■ **Motorola, Inc.** *and* **U.S. Robotics** *have sparred recently over who has the* **better 56K bit/sec modem deal.** *Motorola is offering discounts on its replacements for U.S. Robotics-backed X2 modems. Motorola will also offer a discounted 56K bit/sec modem of its own — once 56K bit/sec standards have been set — or an ISDN terminal adapter for users that want even more bandwidth. The value of the discounts was not announced.*

U.S. Robotics responded with promises to upgrade its own modems to the X2 level and, ultimately, to whatever standard is set.

Motorola: (800) 426-6336; U.S. Robotics: (800) 877-2677.

■ **SDL Communications, Inc.** *last week introduced a PCI-based WAN adapter capable of supporting T-3 and High Speed Serial Interface speeds. The CC3i adapter is targeted at users with high-speed data and* **video applications.** *The adapter includes interfaces to frame relay, ATM or SMDS services. It is available now for $3,000.*

SDL: (508) 238-4490.

■ **Candle Corp.** *last week* **acquired PowerQ Software Corp.,** *an application test and software developer of IBM's MQSeries message-oriented middleware products. Financial details of the acquisition were not disclosed, but Candle will take over and use PowerQ's application lab in Norcross, Ga.*

Candle: (310) 829-5800.

■ *As expected,* **Toshiba Corp.** *and* **Cisco Systems, Inc.** *have announced they will work together to define standards for next-generation multilayer switching technology for* **high-performance internets.** *The joint effort will draw on the two companies' multilayer switching technologies — Cisco's Tag Switching and Toshiba's Cell Switch Router. The new technology will be installed at the test sites of the WIDE project, the undertaking by one of Japan's leading 'Net-project consortiums.*

Eli Lilly cures IP ills

TCP/IP, growth of 'Net create sticky addressing problems.

By Jim Duffy
Indianapolis

As companies standardize their networks on TCP/IP and grant Internet access to their workers, management of IP addresses has emerged as a critical issue.

Assigning and keeping track of addresses is typically a time-consuming, manual process. If duplicate IP addresses are assigned, networked clients can be knocked offline. Moreover, each assigned address needs to have a Domain Name Service (DNS) name attached to it.

These problems are magnified at a company such as pharmaceutical giant Eli Lilly and Co., which has assigned 20,000 addresses and is doling out 500 to 600 more each month.

The company currently logs addresses in a homegrown database. But the growth of IP nodes is forcing a change.

"The way it was set up was OK when we were doing only a couple of hundred per month," said Allen Householder, Eli Lilly network engineer. "But [it was] a lot more manpower-intensive."

Eli Lilly needed a way to automate address assignment and DNS name mapping so its network administrators would not become overwhelmed.

"Probably about half of our time that we spend managing IP addresses is doing DNS entries," Householder said. "People at Lilly tend to move offices once every two years or so, on the average. When that happens, that usually entails an IP address change and a DNS change. Automation . . . lets us reduce the amount of work that it takes to do that down to just a few minutes."

The company evaluated Dynamic Host Configuration Protocol (DHCP) servers to handle the address mess. But DHCP was not mature enough for Eli Lilly's liking.

"We're holding back [on DHCP] to make sure the protocols work and that there's some server-to-server interaction," Householder said.

Eli Lilly settled on Quadritek Systems, Inc.'s QIP address management system. QIP's ability to automate address-to-DNS name linkages was important, he said.

Eli Lilly also hopes QIP can handle Variable Length Subnet Masks (VLSM), which the company will start deploying in three or four months when it migrates to a switched environment. VLSMs help conserve address space by adding a second subnet mask to network addresses via an extended-network prefix.

Eli Lilly does not need the address conservation capabilities of VLSM because the company uses Class A addresses and has 16 million addresses at its disposal, Householder said.

But in a switched environment, VLSM will help the company locate devices on multiple segments attached to a single router port.

"Instead of having a router port dedicated to every LAN, you'll have a switch dedicated to every LAN and a few router ports dedicated to a switch or a group of switches," Householder said. "So you wind up having more addresses on a single subnet; our current subnet mask just isn't big enough." ■

Keys to the move

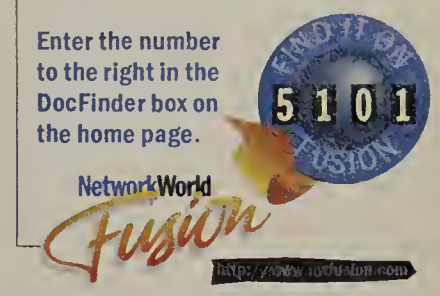
Eli Lilly needed to:

- Manage growth of IP addresses, which are increasing by 500 to 600 per month.
- Avoid IP address duplication.
- Automate DNS entries, which was a time-consuming, manual process.
- Alleviate "Server not available" conditions.
- Build in future support for DHCP and Variable Length Subnet Masks.

Get more info online:

- A primer on the Dynamic Host Configuration Protocol
- A technical overview of Quadritek's QIP
- A look at the routing problems with large, subnetted IP nets

Enter the number to the right in the DocFinder box on the home page.



Boole harnesses IBM MQSeries enterprises

Additions to Command MQ make it easier for users to manage complex configurations.

By Michael Cooney
San Jose, Calif.

Boole & Babbage, Inc. last week unveiled new tools aimed at improving the end-to-end management of IBM MQSeries middleware-based resources.

The company added a central database called MQAssist and an automation package called AutoOperator to its Command MQ management package. The new tools are part of an effort to make it easier for users to manage the sometimes complex configuration and network performance of an MQSeries-based environment.

MQSeries is IBM's asynchronous store-and-forward communications technology that can connect distributed applications across products from various vendors.

"MQSeries environments, because they are by nature multiprotocol, multivendor environments, are inherently complex for most administrators," said Saverio Merlo, senior vice president of marketing for Boole & Babbage. "Our goal is to keep the highly distributed applications running on MQSeries available while reducing the administration task."

Command MQ is an MVS mainframe-based software package that works by gathering data from SNMP-based Command agent software on remote devices.

That information can now be stored back on the new MQAssist database and monitored from an MQAssist console or from any industry SNMP monitoring system.

MQAssist initially will support MQSeries on OS/2-, AIX-, MVS-, OS/400- and HP-UX-based devices.

The SNMP agents report status, configuration and performance data back to the MQAssist package. With this package, users can customize Management Information Bases to manage collections of MQSeries devices or resources, Merlo said.

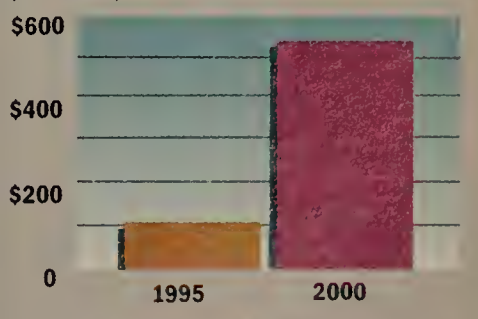
The AutoOperator can also use the data from MQAssist to automatically invoke a response to a system problem. For example, if an MQSeries device becomes overly congested, an automation routine can be invoked to direct that traffic to another queue or node.

MQAssist and AutoOperator will be available in January for $15,000. Command MQ for the mainframe is available now starting at $30,000.

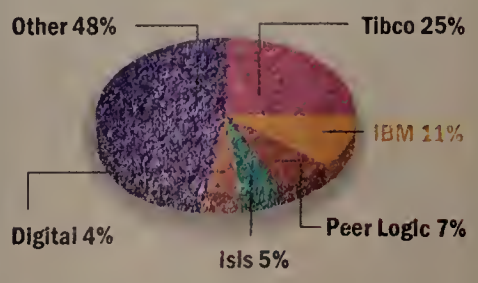
✆Boole & Babbage: (800) 544-2152.

BIG IN THE MIDDLE

Message-oriented middleware market
(In millions)



1995 message-oriented middleware market
IBM's MQSeries owns 11% of the market.



SOURCE: IDC, FRAMINGHAM, MASS.

IT'S AN INTERN

IT'S A FILE AND PRINT

The most predictable thing about business is that it's unpredictable. Your needs are likely to be different from one day to the next (or for that matter, from one department to another). You either need a range of servers to accommodate all your different needs. Or one affordable server with a very wide range.

Introducing the new Compaq ProLiant 2500. Simply put, it's the most versatile platform available today. Its modular chassis lets you easily swap components to meet any new set of requirements. So you only need to purchase for your needs today. And as your

ET SERVER. IT'S AN APPLICATION SERVER.
SERVER. CAN AN IDENTITY CRISIS BE A VIRTUE?

business grows, the Compaq ProLiant 2500 provides the scalability to go from file and print to Internet or application server. While

distributed @ access

giving you the availability and management features you need to run your mission-critical applications. And with Distributed Access, the information you need will always be close at hand.

In other words, it's the first platform that's versatile and flexible enough to run your business on—today and tomorrow. To find out more about the ProLiant 2500 or Distributed Access, visit us at www.compaq.com/us, or call 1-800-319-7778 to locate the Compaq reseller near you.

COMPAQ

Has It Changed Your Life Yet?

INTERNETWORKING MONITOR

Dissecting the anatomy of a hit

Among the many things the Web revolution ushered in was the use of the word "hit" to describe Web system activity. Now we hear about Web hits every day. Given the term's ubiquity and how freely it is used, you'd think its meaning would be well understood. The truth is far from that.

While it has taken its place as a de facto standard of measurement, the hit is rarely understood by those who use the term. Worse, the manner in which it is used, to quantify Web access, is at best only roughly accurate and often downright misleading. Certainly, in an age where advertising is being sold based on hit rates, having such a slippery metric could be a big problem.

First, let's look at what a hit is not. It does not represent a user, a session, a transaction, a network packet or even Web page access. Technically, a hit is a single HTTP protocol request (usually a GET) sent from a browser and processed by a Web server.

A hit is normally supposed to have some relation to access or load. It doesn't, and that's the problem. The actual value of a hit is as elusive and ambiguous as the Internet itself. The meaning of a hit varies so widely, even on the same system, that the term "hit rate" is close to meaningless as a metric.

Kevin Tolly

For instance, bringing up a text-only page will register as a single hit. On the other hand, a page decorated with graphics can cause 10 or more hits to be logged. That's because the browser sends a separate HTTP request to the server for each graphical image.

Because of all this, using hit rates to estimate system or network utilization is downright dangerous. There is simply no correlation between the two. You can prove it to yourself (though it might be safer not to try). Here's what we did.

We placed a 23M-byte AVI file on a Web server and created a Web page that contained a pointer to it. A click on the URL triggered the browser to autoload the entire file across the network. Even across a 10M bit/sec cut-through switch, this required close to a minute of constant traffic as thousands of IP packets traveled between Web server and browser.

How many hits does this count as? Would you believe just one? It's true. The entire file flowed from the server to browser as the result of a single HTTP request. One request equals one hit. Thus, any network manager who attempts to determine the load, cost, resource or whatever of a single hit has an impossible task. Unless we know much more about the workload associated with a particular hit, we have no real chance of making a correlation.

Because of all this, using hit rates to estimate system or network utilization is downright dangerous.

What we need is to be able to classify hits by their relative cost in system resources. It is easy enough for Web designers to embed such an attribute in Web pages. But analysis and accounting packages would need to allow custom reporting to retrieve this information.

Vendors, are you listening?

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (908) 528-3300 or at ktolly@tolly.com.

Carrier Services

Covering: Local and Long-Distance Services • Value-Added Networks • Cable, Satellite and Wireless Networks • Regulatory Affairs • Carrier-Based Internet Services

Briefs

■ *Frame relay specialist* **Intermedia Communications, Inc.** *and* **NYNEX Corp.** *have signed a local* **interconnection agreement** *initially covering New York state. Under the agreement, Intermedia may lease unbundled elements of NYNEX's network — specifically including NYNEX's frame relay network — as needed. NYNEX also promised that its customers switching to Intermedia can keep their telephone numbers. Intermedia President David Ruberg hailed the deal as one of the first since an appeals court halted federal interconnection rules, and such deals can still proceed under state guidelines.*

TELECOM IN TRANSITION

■ **AT&T** *and* **MCI Communications Corp.** *have each extended and expanded long-term contracts with a key customer. AT&T inked a new 10-year contract with Choice Hotels International, Inc. to combine previously separate long-distance and toll-free pacts into a* **single AT&T One-Net service contract** *for 3,100 corporate and hotel locations. The Choice chain includes Quality, Comfort, Sleep, Econo Lodge, Rodeway and MainStay Suites hotels. MCI renewed and expanded a comprehensive contract with Bank of America, the principal subsidiary of BankAmerica Corp. The three-year deal includes Virtual Network* **virtual private net service** *to 2,000 branches, as well as 800 service and international private lines.*

■ *An affiliate of* **LDDS WorldCom** *next month will begin accepting orders for the first commercial* **frame relay service** *between the U.S. and China. WorldCom International and the Shanghai Posts and Telecoms Administration have installed a frame relay network-to-network interface that lets the two carriers interconnect in Shanghai. WorldCom officials expect initial frame relay traffic into China to include file-transfer applications, E-mail and 'Net access.*

AT&T's FRAD services not panacea

Carrier's help in SNA migrations welcomed, but LAN traffic may have to fend for itself.

By David Rohde

Call it a major step toward moving SNA applications off expensive private lines. But don't call it a quantum leap toward running multiprotocol traffic over frame relay nets.

That was the word from analysts and rival carriers about AT&T's announcement of two new services to manage and maintain frame relay access devices (FRAD) at the customer premises or AT&T central offices.

The services — dubbed the AT&T Managed FRAD Solution and the Central Office FRAD option, respectively — represent AT&T's long-awaited entry into the managed SNA-over-frame relay market (*NW*, Nov. 18, page 8).

Kissing old handles goodbye

AT&T is dropping its trade names in favor of generic service descriptions emphasizing the carrier's name.

Old name	New name
Accunet	AT&T Private Line Service
Accunet Packet Service	AT&T X.25 Service
InterSpan Frame Relay Service	AT&T Frame Relay Service
InterSpan ATM Service	AT&T ATM Service
AccuWAN	AT&T Managed Router and Managed FRAD Services

Sprint ahead

First among the major carriers, Sprint Corp. introduced its managed FRAD service in September 1995. Sprint is now evaluating a central office FRAD offering, but Brad Hokamp, Sprint's director of data product management, questions how much good it would actually do.

"The customers that want to migrate to frame relay want to collapse their SNA and LAN [wide-area] networks," Hokamp said. "The central office FRAD solution doesn't do that."

AT&T officials conceded that letting a carrier convert SNA users' Synchronous Data Link Control traffic at the central office essentially rules out a user's other protocols running across the same circuits. That is why AT&T is also offering to put the FRAD on the customer premises to act as a companion to its recently renamed Managed Router service (see graphic).

"We do a lot of SNA on the Managed Router service, but [the Managed FRAD service] is more focused on the legacy customer," said James Lamb, AT&T's product manager for managed network solutions. "It gives us the serial density you need to support multiprotocol traffic."

By contrast, the central office FRAD service is designed for customers with a single protocol type that seek a simple path to frame relay with little or no changes to CPE. Users can even maintain their existing analog multidrop private lines to a single location, which would then connect over a digital private line to the AT&T frame relay network.

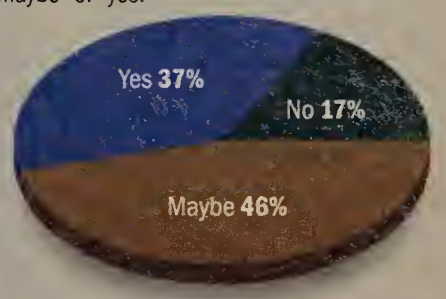
The problem with that configuration, said Sprint's Hokamp, is that each site continues to be dependent on every other site along the multidrop line, even though the traffic is ultimately converted to frame relay. This could affect performance.

For many users, according to Hokamp, that is a situation that could be better served by installing a separate frame relay permanent virtual circuit between the host site and each branch or terminal.

Even then, putting a FRAD on the customer premises to convert SDLC traffic to frame relay offers only limited ability to carry popular LAN-to-WAN protocols such as TCP/IP and Novell, Inc.'s SPX/IPX, he added. ■

CONSIDER THIS

When asked if they would consider using a central office FRAD service from a carrier — even if it transported only SNA traffic over frame relay — the majority of large users surveyed answered "maybe" or "yes."



SOURCE: FRAME RELAY SYSTEMS & TECHNOLOGY, CHEVY CHASE, MD.

'Net upgrade: Sprint weaves OC-3 overseas

By David Rohde
Pennsauken, N.J.

Sprint Corp. earlier this month initiated what it is labeling the first OC-3 Internet link between the U.S. and Europe, a move that sparked quibbling from a key rival.

In a now-familiar game of leapfrog, the action set off a round of squabbling between Sprint and MCI Communications Corp. for supremacy in acknowledged Internet backbone network speeds.

The new Sprint link carries native TCP/IP traffic at a speed of 155M bit/sec between the Sprint Network Access Point here and the Stockholm NAP of Sweden's leading Internet service provider.

According to Sprint officials, the move is needed to carry traffic generated by the International Connections Manager Network, a Sprint-led network for scientific collaboration (see graphic).

By contrast, MCI's new Concert InternetPlus global IP backbone — formed by lashing together its domestic Internet network with that of merger partner British Telecommunications plc — runs at the slower speed of DS-3, or 45M bit/sec (*NW*, June 17, page 12).

But MCI officials last week said that, if needed, MCI could carry IP traffic via 15 OC-3 circuits on the TAT-12/13 Trans-Atlantic Telecommunications cable, with eight of the circuits terminating in France and seven in Great Britain. Still, they acknowledged that those OC-3 circuits are not exclusively devoted to Internet traffic.

What is ICMNet?

The International Connections Manager Network, or ICMNet, provides global connectivity for the U.S. scientific and educational community. It was established by a 1990 agreement between Sprint and the National Science Foundation.

Ironically, the global upgrades come as the two leading U.S. carriers of Internet backbone traffic pursue different strategies for top speed on their domestic networks. While Sprint is installing OC-3 trunking throughout the U.S., MCI this month completed an OC-12 backbone, having just started the project at the beginning of the summer (*NW*, June 24, page 1).

Some observers privately label the MCI transmission upgrade as overkill because its Cisco Systems, Inc. routers cannot put out traffic any faster than the OC-3 standard.

That's true, conceded Robert Hagens, MCI's director of Internet engineering. But the core of MCI's backbone consists of FORE Systems, Inc. ATM ASX-1000 switches taking in traffic from several Cisco 7000 or 7500 routers running in parallel, Hagens said.

Because each of those routers is fully meshed with each Cisco router at another core backbone node in the network, in aggregate they can push through well over 155M bit/sec in traffic from one location to the other, as high as the OC-12 transmission limit of 622M bit/sec, he said. ■

Voice over IP is sounding better

By Tim Greene

The underlying principle behind running voice over packet networks is simple: Free is good.

The argument goes that if you are already paying for a data network, it costs nothing extra to put voice on your wide-area link.

But there are other benefits that early users of the technology are starting to realize. For example, the U.S. Army is attracted because a single, consolidated voice/data network deploys twice as fast as two networks requiring separate wiring.

In an established corporate setting, a single voice/data network translates into the ability to drop some voice lines for savings.

For the Army, IP voice also means less gear. With Vienna Systems Corp.'s Vienna.com products that the Army will test in the Balkans next year, telephone handsets are unnecessary in some cases. Laptops with built-in microphones and speakers fill that role, according to Gil Benjamin, chief of the Logistics and Readiness Center of the Communications Electronics Command in Fort Monmouth, N.J. In a private enterprise, that can mean simplified desktops.

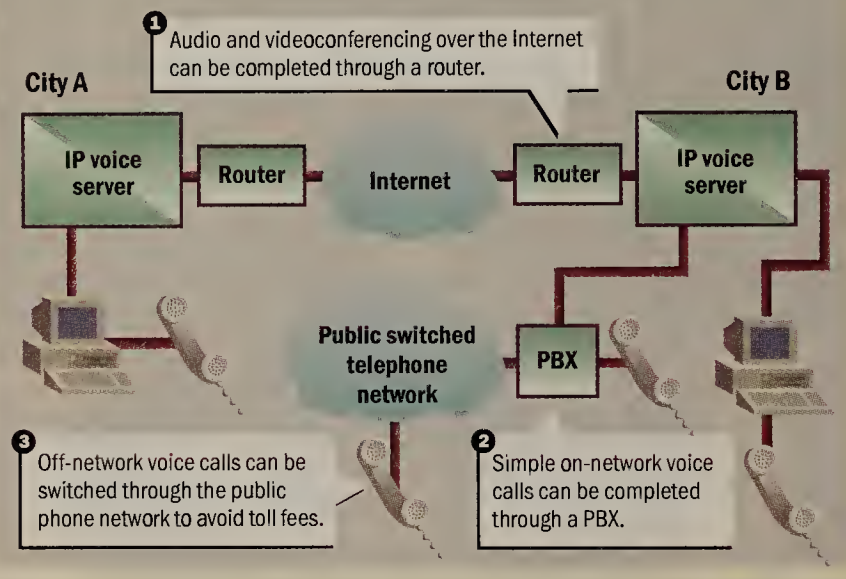
Voice over IP products also have an advantage over voice over frame relay products in that they do not stand between the existing router and the WAN, according to Bob Nerz, president of Network Technologies, a network design firm in North Attleboro, Mass., who has installed IP voice systems. That lets the router do what it does best: shape and prioritize traffic.

And that is important to Norand Corp., a maker of ruggedized, hand-held PCs that is using Micom Communications Corp. voice over IP gear. It needed the sophistication of its Cisco Systems, Inc. routers at the edge of its WAN to properly queue IP and IPX traffic traversing their frame relay network.

"Prioritizing of voice is simple, but there is all kinds of prioritizing we want to do on the data side," said Mike Lutz, senior network systems administrator at Norand.

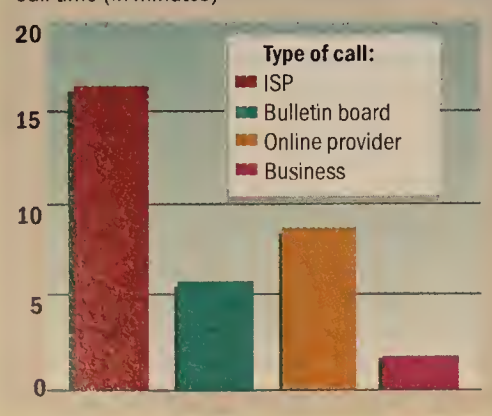
IP VOICE POSSIBILITIES

Here are three applications vendors are developing for voice over IP.



WHY TELCOS HATE IP

"Usage-sensitive charges for [ISPs] need to be established in order to send rational pricing signals for their use of the public switching network," according to a US WEST study presented to the FCC.



Internet traffic jam

The trouble with any packet voice, including IP and frame relay, is that the voice packets may be delayed by other traffic being sent down the same pipe. If the network is the Internet, it may be further delayed by packets in a single voice stream taking different paths. With file transfers or E-mail, that doesn't matter because the datagrams eventually get through and can be reassembled.

But with voice, there is just a brief time window in which all or most of the voice transmission must arrive and be reassembled. Users who are more than just hobbyists tinkering with the technology become dissatisfied with long delays between speaking and receiving a response. Those trying to conduct business will not tolerate gaps in sentences or words that get chopped off because packets did not arrive on time.

Vendors are working on that with silence suppression algorithms that weed out silences before the voice stream is sent, and inject it again at the receiving end. That coupled with compression reduces bandwidth for a voice channel to about 8K bit/sec.

But there are some things beyond their control — in particular, the Internet.

On the 'Net, unpredictable congestion problems and packet losses can devastate voice quality, according to Turner Hunt, president of Global Exchange Carrier, Inc. (GXC), an Abingdon, Va., firm that sells an international IP voice service.

"You may get 30% to 40% packet loss, but that is the chance you take," Turner said. Then again, he said, when traffic is lighter, the voice might have 90% of the quality of a toll voice call.

The trade-off for users is that IP voice over the Internet makes the long-distance link much less expensive. For instance, Alphanet Telecom, Inc., which plans to offer international IP voice service next year, promises 20% to 40% off the cost of international dial-up.

Free won't last forever

The answer will be industrial-strength IP networks, according to Ken Guy, marketing vice president for Micom, which makes voice over IP gear. Users will pay a premium for these private backbones, but still less than long-distance switched voice. "These are not the type of thing you're paying $19.95 a month for," Guy said.

GXC's Turner said that is just what his company will do if Internet voice quality degenerates. By leasing international frame relay links, GXC can guarantee bandwidth and get better control of voice quality. Prices will still undercut those of traditional voice carriers, he said.

Users should remember IP voice is still in a shakedown period.

Tom Hutton, telecom research engineer at Florida Power and Light Co. (FP&L), said the company has been experimenting with IP voice over the Internet for its laptop-carrying field force. But the company faced initial problems clearing the FP&L firewall — a surmountable problem but a demonstration that the technology is not yet plug-and-play.

"I don't want to depend on it yet," Hutton said. ■

You want to be able to call anyone

All the hype about IP telephony masks one critical fact: If you don't have the same IP voice software as the person you are trying to call, most likely you won't be able to talk to each other.

Although most vendors are moving toward compliance with H.323, an International Telecommunication Union (ITU) standard for multimedia conferencing, mutual compliance with a standard does not guarantee two products will actually work together. Two camps are tackling this issue. The Internet Telephony Consortium (ITC) at the Massachusetts Institute of Technology has met twice so far. It wants to research how IP voice systems are set up and how interoperability can be assured. The ITC suggests that a research forum come up with answers before big-time competition breaks out in the market.

But that does not seem destined to happen.

A second group, the Voice Over IP (VoIP) Forum, is made up of vendors who want to deal strictly with practical interoperability problems by the middle of next year.

According to VoIP Forum Chairman Michael Knappe, the group of 32 major vendors hopes to agree on interoperability parameters, and may suggest them to the ITU as an addendum to H.323.

The ultimate goal, Knappe said, is for users to call anyone from their PCs, whether the recipient is hooked into the Internet or just has a standard phone.

That will require users' IP voice software to interoperate with whatever IP gateway the phone companies put in front of their switches, he said. "To be able to connect with anyone increases the market value of the technology. You have to make it easy to connect with everybody," Knappe said.

If that kind of universal connectivity becomes popular, he said, then users will push for greater quality.

Vendors are hoping that massive Internet buildout will solve bandwidth problems that delay voice. But no one has direct control of that, so vendors are working on other things.

Should I RSVP?

Vendors are already working on implementing the Resource Reservation Protocol (RSVP), which carves out bandwidth across the Internet for time-sensitive traffic.

RSVP was designed for multimedia over IP, but would work as well for voice. With it, routers signal each other to request a clear path through a network and set it up. The major drawback: It is possible to get so many such requests that the routers cannot honor all of them (*NW*, Oct. 28, page 47).

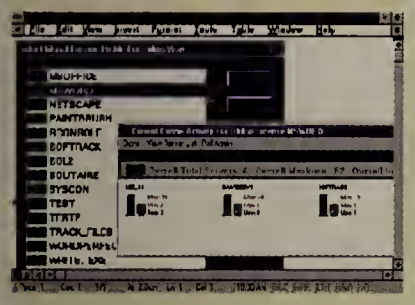
— Tim Greene

Local Networks

Covering: Servers • Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

Briefs

■ **ON Technology Corp.** *last week rolled out a* **software license metering** *product that enables an administrator to track software usage on Windows NT and NetWare servers from a*



32-bit Windows 95 console. SofTrack for Windows NT, a server-based product that requires no additional client software, lets an administrator share licenses between NT and NetWare applications servers.

SofTrack for Windows NT is available immediately, and pricing ranges from $795 for 25 users to $5,995 for 1,000 users. ON Technology is also offering a 30-day free trial program.

ON Technology: (617) 374-1400.

■ **Sun Microsystems, Inc.** *last week donated nine Ultra Enterprise 5000 symmetric multiprocessor servers to the Massachusetts Institute of Technology's Xolas project. The goal of the project is to* **test high-performance parallel servers** *for use in scientific research applications. MIT will cluster the nine servers into one supercomputing system to compute physical science applications.*

Sun: (800) 786-0404.

■ **NCR Corp.** *last week added disk-mirroring capabilities to its* **LifeKeeper failover and clustering software.** *In a two-way cluster, LifeKeeper can now mirror data written on one server's disks to the other system. While not designed to eliminate the need for an external disk subsystem, the disk-mirroring capabilities allow users to continue working should one system fail.*

NCR: (800) 225-5627.

Seagate, Microsoft cement NT backup deal

By John Robinson
Lake Mary, Fla.

Microsoft Corp. has renewed Seagate Software, Inc.'s backup lease, selecting the company to provide storage management and backup for the next generation of Windows NT.

Under the terms of the agreement announced last week, Seagate will release a new version of its Windows NT Backup utility to support Microsoft's NT Changer Media Services (NTMS) and NT Media Changer drivers. It will also upgrade its line of backup and storage management software to support the new file, directory and storage services built into the new version of Windows NT. In addition, the Seagate software will support new hierarchical storage management (HSM) capabilities built into the operating system.

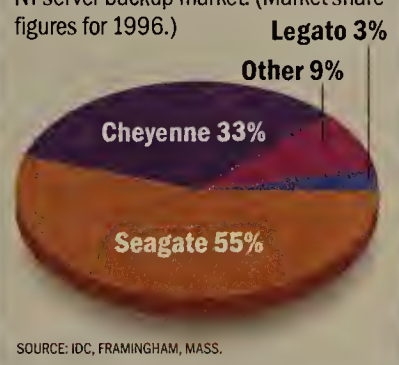
Microsoft's NTMS allow users to share storage resources such as robotic libraries and drives among multiple applications. Seagate is developing its backup utilities to support the NTMS API, which will allow users of Seagate storage management applications to manage, track and maintain those secondary storage devices. Seagate will also support HighGround Systems, Inc.'s NTMS extensions, which Microsoft is embedding in Windows NT 5.0.

On the HSM front, the storage management groups of Seagate and Wang Laboratories, Inc. are working to develop HSM capabilities for Windows NT networks.

HSM simplifies data storage and retrieval by identifying inactive data and moving it to a near-line storage system, where it can be quickly accessed. One stumbling block for the technology has been the lack of HSM-aware backup and management utilities.

A NICE SLICE

Seagate holds a commanding lead over competitors in the $40 million Windows NT server backup market. (Market share figures for 1996.)



SOURCE: IDC, FRAMINGHAM, MASS.

In the first stage of the Seagate/Wang deal, Seagate will rig its Backup Exec and Seagate ExecView applications to provide backup and management of Wang Open/Stor for NT HSM software.

The integration will allow Backup Exec to provide disaster recovery services for the HSM software and let ExecView administer and manage Open/Stor HSM servers.

✆Seagate: (407) 333-7500.

Vendors partner to bring ATM into video picture

By Jodi Cohen
Santa Clara, Calif.

The jury is still out on whether desktop videoconferencing will be widely adopted as a key business application. But First Virtual Corp. (FVC) and PictureTel Corp. are betting the technology will receive a favorable verdict.

The companies have announced a joint development agreement whereby FVC will provide 25M bit/sec ATM interfaces for PictureTel's entire videoconferencing product line, as well as bundle its Multimedia Operating System (MOS) ATM middleware with PictureTel's 384K bit/sec desktop video system. The move allows customers to use ATM instead of ISDN to support conferencing.

ATM — with its quality-of-service features — is the best network technology for delivering video to the desktop, according to Kathryn Korostoff, president of Sage Research, Inc., a Natick, Mass.-based market research firm.

"Everything used to be based on ISDN, but ISDN requires you to bring another wire to the desktop," she said. "By using ATM, customers can run voice, data and video applications over existing Category 5 [unshielded twisted pair] cabling."

FVC's *Ungermann says FCC-PictureTel's products will increase productivity.*

The companies' high-quality video is targeted at business executives. Companies may find that it is more cost-effective to install a videoconferencing system than pay big bucks for corporate travel, analysts said.

The FVC-PictureTel integrated products will increase productivity and speed virtual teaming and collaboration, according to Ralph Ungermann, president and chief executive officer of FVC.

In fact, demand for desktop video is on the rise. In a recent study of 270 U.S. companies, 19% are using desktop videoconferencing and another 47% plan to use it within two years, according to Sage Research.

Pricing for the ATM interfaces — available by year-end — starts at $1,000. The MOS bundle is priced at $600 and will ship at the end of this month.

✆FVC: (800) 351-8539; PictureTel: (508) 762-5400.

Newbridge and Interphase bring MPOA to servers

By Jodi Cohen
Herndon, Va.

Newbridge Networks, Inc. last week announced that it has partnered with Interphase Corp. to develop a network interface card (NIC) that lets customers mix ATM and Layer 3 traffic such as IP and IPX.

The PCI-based card — designed primarily for servers — provides switched routing capabilities based on the ATM Forum's emerging Multi-Protocol over ATM (MPOA) standard, which lets customers integrate legacy multiprotocol nets with ATM. Previously, Newbridge supported MPOA only in its VIVID LAN switches.

Hey, what's MPOA?

The emerging ATM Forum specification, Multi-Protocol over ATM, provides a standard approach to forwarding Layer 3 data – such as IP or IPX traffic – over ATM backbones.

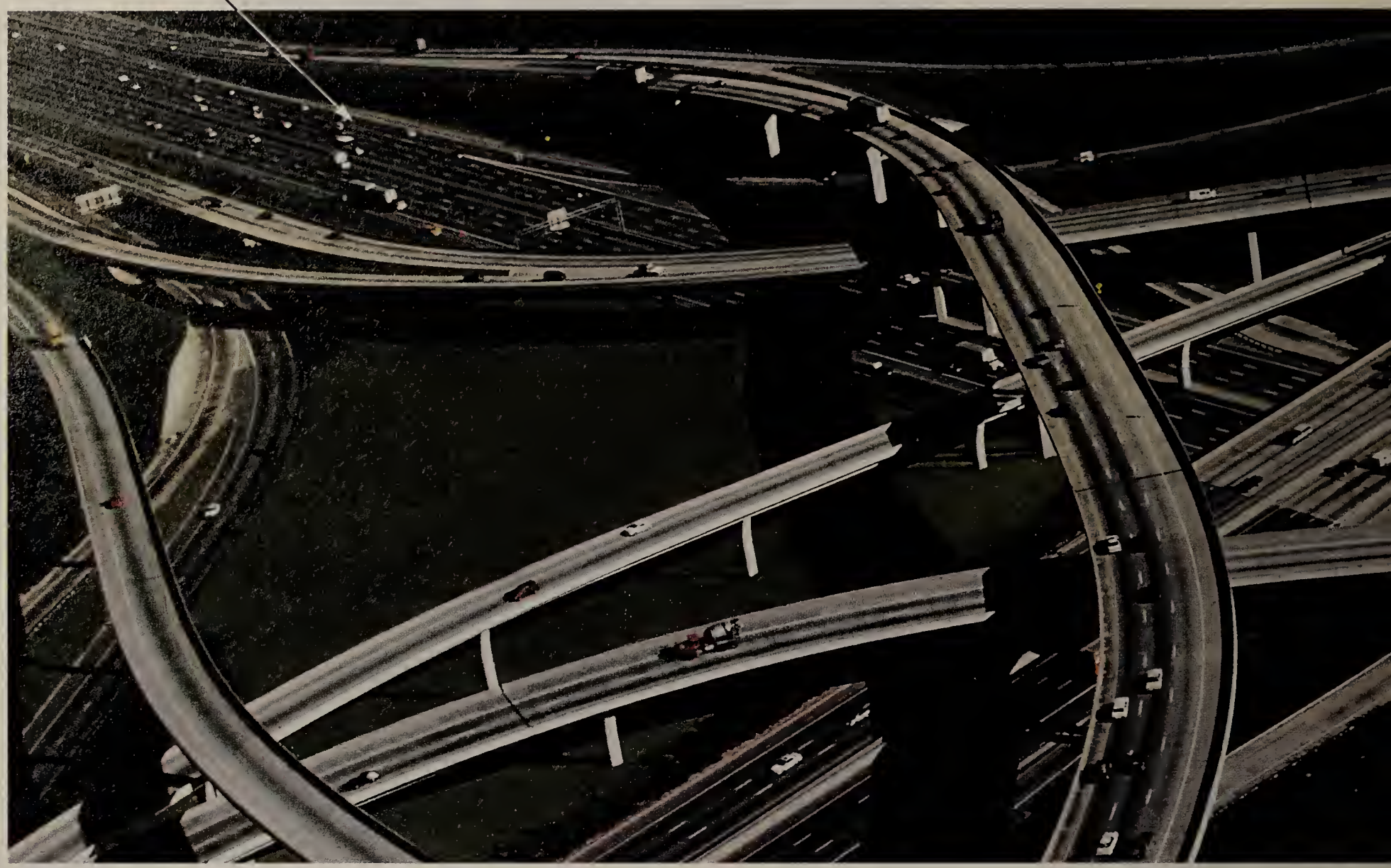
"Newbridge is the first vendor to position a complete end-to-end MPOA solution — switches and NICs — that can be implemented today by users," said John Morency, principal at The Registry, Inc., a consultancy based in Newton, Mass. "A lot of the other vendors out there — like Cisco and Ipsilon — are either selling vaporware or are at the very early stages of product implementation."

Both Cisco Systems, Inc. and Ipsilon Networks, Inc. are touting separate solutions — Tag Switching and IP Switching, respectively — for increasing performance of IP networks. But both implementations seem to be targeted primarily at Internet service providers, Morency said. Also, IP switching is IP-centric, whereas MPOA is inherently multiprotocol.

The PCI ATM adapter, which includes drivers for Windows NT and NetWare, is available now for $1,495.

✆Newbridge: (703) 834-3600; Interphase: (214) 919-9000.

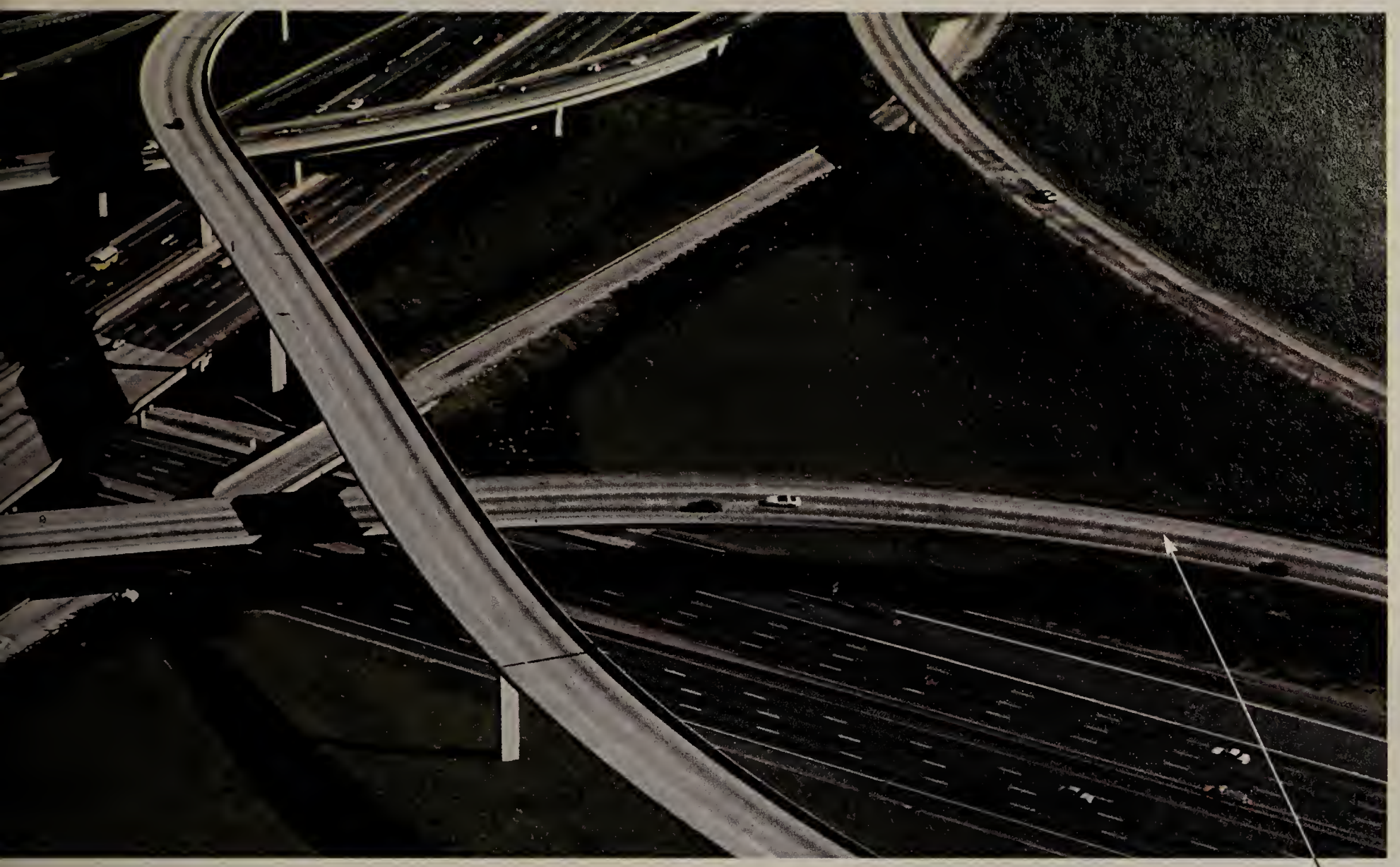
Now We Have A Way To Get You From Here



You are here. Your network is sprouting up like an out-of-control weed here, here, here and here. And it's probably not going to stop growing any time soon. Clearly, what's needed here is a solution that can keep pace with your expanding enterprise.

This is the Compaq Netelligent 8500 Communications Platform. (But you can just ask for our new router.)

Compaq Netelligent is our complete line of net-working products. And like all great products, ours started with great companies. By making Thomas-Conrad and Networth part of Compaq, we're able to combine their industry-leading products with our networked computer experience. And provide you with high-quality, highly reliable solutions for your network.



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A network that runs like clockwork? Who says you can't get there from here? Certainly not us.

COMPAQ

Has It Changed Your Life Yet?

WIRED WINDOWS

Java Armageddon is upon us!

I am writing this on the eve of the fall Comdex show— an event I've tried hard to avoid during the past 10 years.

Evidently, my reflexes are slipping (just one more sign of approaching what I euphemistically call "late middle age"). Before exposing myself to something only P. T. Barnum could enjoy, I want to mention two items that stand out amid the flurry of preshow announcements.

Rumor has it that Microsoft Corp. will soon announce its own version of the Java Virtual Machine (JVM), the platform-specific code that allows Java applications to run, unchanged, in any operating system environment.

You might think I'd applaud this as I am a big fan of Java because of its soon-to-be ubiquity.

With Sun Microsystems, Inc.'s JVM appearing in browsers and operating systems everywhere, Java applications could run anywhere, and developers would be free to simply write great applications without having to pick the appropriate operating system to write for.

Utopia seemed to be just around the corner!

I'm sure Microsoft will promise that its JVM will be 100% compatible with Sun's — only faster, or with better graphics or some other extension that will make applications written to the Microsoft spec incompatible with the Sun JVM. But not vice versa. The Microsoft engine will handle anything written to Sun's spec.

One of the first questions will be: How many platforms will the Microsoft JVM support? If the track records of Windows NT and Internet Explorer are any indication, this looks like one more attempt to lock the world into the so-called Wintel standard.

Dave Kearns

So instead of Utopia, we're facing the Java Armageddon — an extension of the browser wars on a larger scale. Maybe it's time to "just say no."

On the factual front, Novell, Inc. and Sun have cross-licensed technology in a move that should benefit both companies at Microsoft's expense.

Microsoft recently unveiled its projected enterprise directory system — due, most likely, in 1998 — as a pale reflection of Novell Directory Services (NDS). The Sun-Novell agreement buttresses Novell's position as the leading directory services vendor by promising NDS for Solaris within the next year. Coupled with the existing NDS for SCO Unix and the soon-to-be released NDS for Windows NT, Novell should have a big lead in the soon-to-be very hot directory services market.

In return for the Solaris coup, Novell has promised to port everything Java to the IntranetWare platform.

Novell already has a close relationship with Netscape Communications Corp. and Oracle Corp. With the Sun agreement, Novell is placed firmly in the S-O-N camp. It'll be interesting to see how S-O-N's network computer plays in Provo.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

Tip of the week

Add http://guide.sbanetweb.com/ to your bookmarks. SBA Consulting has compiled an exhaustive list of vendors and their Web addresses. Search for a vendor, click on the link, and you're connected to their home site.

Client/Server Applications

Covering: Databases • Messaging • Groupware
Conferencing • Imaging • Multimedia • Development

Briefs

■ **Veri-Q, Inc.** *of San Francisco next month will release VCOM Client for Applets, a* **message-oriented middleware product** *that lets any Java applet connect to applications on any network operating system. The client software lets Java applets work with VCOM 2.4 middleware, which was just introduced to the U.S. VCOM supports message-based communications among applications on multiple operating systems. Pricing is available from the vendor.*

Veri-Q: (415) 908-1313.

■ **NeoVista Solutions, Inc.** *of Cupertino, Calif., is integrating its NeoVista Decision Series data mining tools with the Informix Universal Server, which will be unveiled in early December. NeoVista is creating a set of what Informix Software, Inc. calls DataBlades, which* **interconnect with the database server through an API.** *Customers will use the tools to build and execute complex data mining applications entirely inside the Informix Universal Server.*

The data mining modules will be available by June 1997 priced from $50,000 to $350,000.

NeoVista: (408) 777-2929.

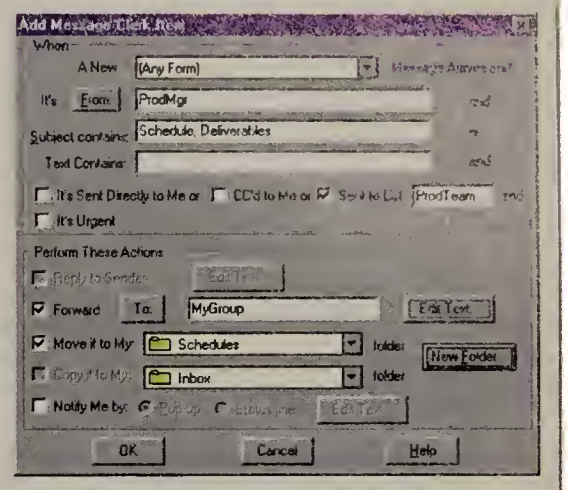
■ **SAP AG** *earlier this month published specifications for 100 new business APIs (BAPI) that are part of its R/3 suite of business applications. The information is available on SAP's Web site (http://www.sap.com/). The public BAPIs are a first step in SAP's efforts to make R/3 more open and interoperable.*

Also, these interfaces let SAP and its customers introduce changes to different R/3 components without affecting other components. In December, SAP will ship the R/3 Internet Application Component

SAP: (800) 685-1727.

Banyan rolls out Intelligent Messaging for Windows NT

Company broadens scope by offering server-side MAPI support.



New version *of Intelligent Messaging service for Windows NT Server uses StreetTalk to locate specific services on a network.*

By Christine Burns
Westborough, Mass.

Banyan Systems, Inc. last week delivered a version of its Intelligent Messaging service for Windows NT Server, a move that gives users an alternative to the company's VINES operating system at the back end and a wider array of clients on the front end.

Intelligent Messaging for Windows NT 1.1 — which integrates tightly with the native StreetTalk Directory Service for Windows NT — is a direct port of the most recent VINES-based messaging engine. The direct ties with StreetTalk are said to ease installation and configuration, enable centralized administration of distributed messaging servers and provide out-of-the-box integration with existing VINES servers.

The feature unique to the NT-based product is support for the server-side Messaging Application Programming Interface (MAPI) 1.0. This interface gives all 16- and 32-bit MAPI desktop applications, such as the Windows Messaging Client in Windows 95 and the Outlook E-mail client expected in Office 97 next month, the ability to send messages via Intelligent Messaging and use StreetTalk to locate specific services on the network.

Previously, Intelligent Messaging on VINES was accessible only by those clients that directly supported Banyan's proprietary messaging APIs, such as BeyondMail and SharkMail. Debra Murphy, Banyan's product-line manager for messaging, said the product will support Windows NT clients in a later release.

"Broadening the scope of both front-end access and server platform support has got to be cornerstone for Banyan right now as it tries to push itself into a larger non-VINES market," said Tim Sloan, director of messaging applications at Aberdeen Group, Inc., a consultancy in Boston.

"Having NT as a strategic platform is going to help Banyan sell more copies of StreetTalk and Intelligent Messaging. But, moreover, it gives the installed base a good reason to stay with Banyan services instead of moving away from them," Sloan said.

Tony Macaloosa, director of information technology at Multicare Company, Inc. in Hackensack, N.J., said Intelligent Messaging for Windows NT is going to speed up his company's migration from a heterogeneous environment with VINES, Novell, Inc.'s NetWare and IBM's AIX to an all Windows NT 4.0 network.

"You can't beat NT as an application server, but there is no way that I wanted to touch NT's domain system," Macaloosa said.

"So while StreetTalk gives me an easier way to tie all of our 56 remote NT servers together, Intelligent Messaging is going to give me centralized control of the distributed mail services running on them," he said.

Intelligent Messaging for Windows NT is available now for $1,495 per server.

©Banyan: (508) 898-1000.

Server software gives NCs access to existing applications

By John Cox
Las Vegas

Server-based software that lets so-called network computers (NC) access existing host and Windows applications was demonstrated here last week at Comdex/Fall '96.

SoftNC, from TriTeal Corp. in Carlsbad, Calif., is Java code that creates a graphical end-user display that is downloaded to the NC. From this display, users can access Unix, Windows and mainframe applications via other TriTeal products on servers, as well as download and run Java applets.

The software lets NC users organize, manage and navigate their desktop environments.

SoftNC has been licensed by several NC vendors selling the systems as low-cost, easy-to-use alternatives to full-blown PCs. Fujitsu, Ltd., Japan Computer Corp., Network Computer Devices, Inc. and Wyse Technology, Inc. have all licensed SoftNC.

TriTeal's software creates a common user desktop across all these NCs. The NC user turns on his network computer and logs on to the network via the SoftNC LoginManager. In response, a Java server downloads about 1.5M bytes of Java applets, including the Java Virtual Machine (the engine that interprets the Java code) and host computer emulators.

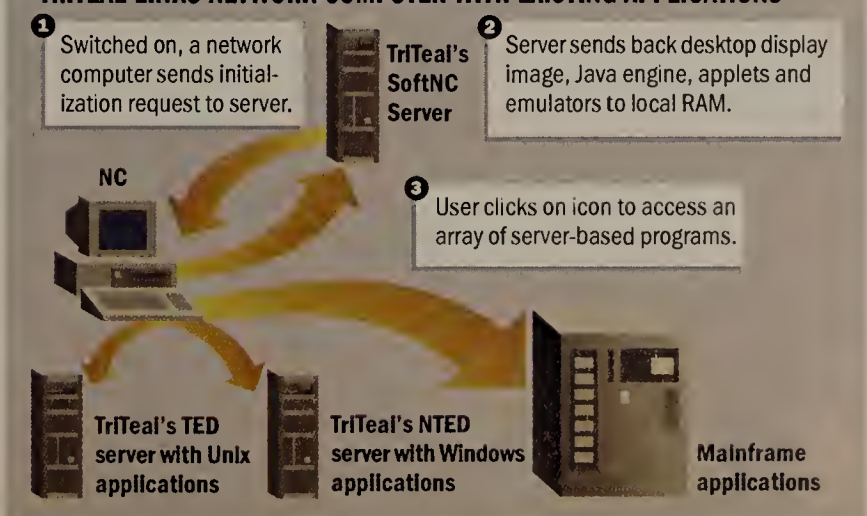
These applets represent a customizable graphical display that shows what applications a given user is allowed to access. Via TriTeal's other server products, TriTeal Enterprise Desktop (TED) for Unix servers, and NTED for Windows NT and 95 application servers, the user can activate existing applications on remote servers.

TED creates a common user interface that runs across different Unix systems. NTED relies on Citrix Systems, Inc.'s multiuser version of Windows NT, called WinFrame. The 3270 and 5250 emulators let users access mainframe and Application System/400 applications.

SoftNC is sold to OEMs and is expected to ship with the first NCs in early 1997. TED and NTED server software is available from TriTeal.

©TriTeal: (619) 930-2077.

TRITEAL LINKS NETWORK COMPUTER WITH EXISTING APPLICATIONS



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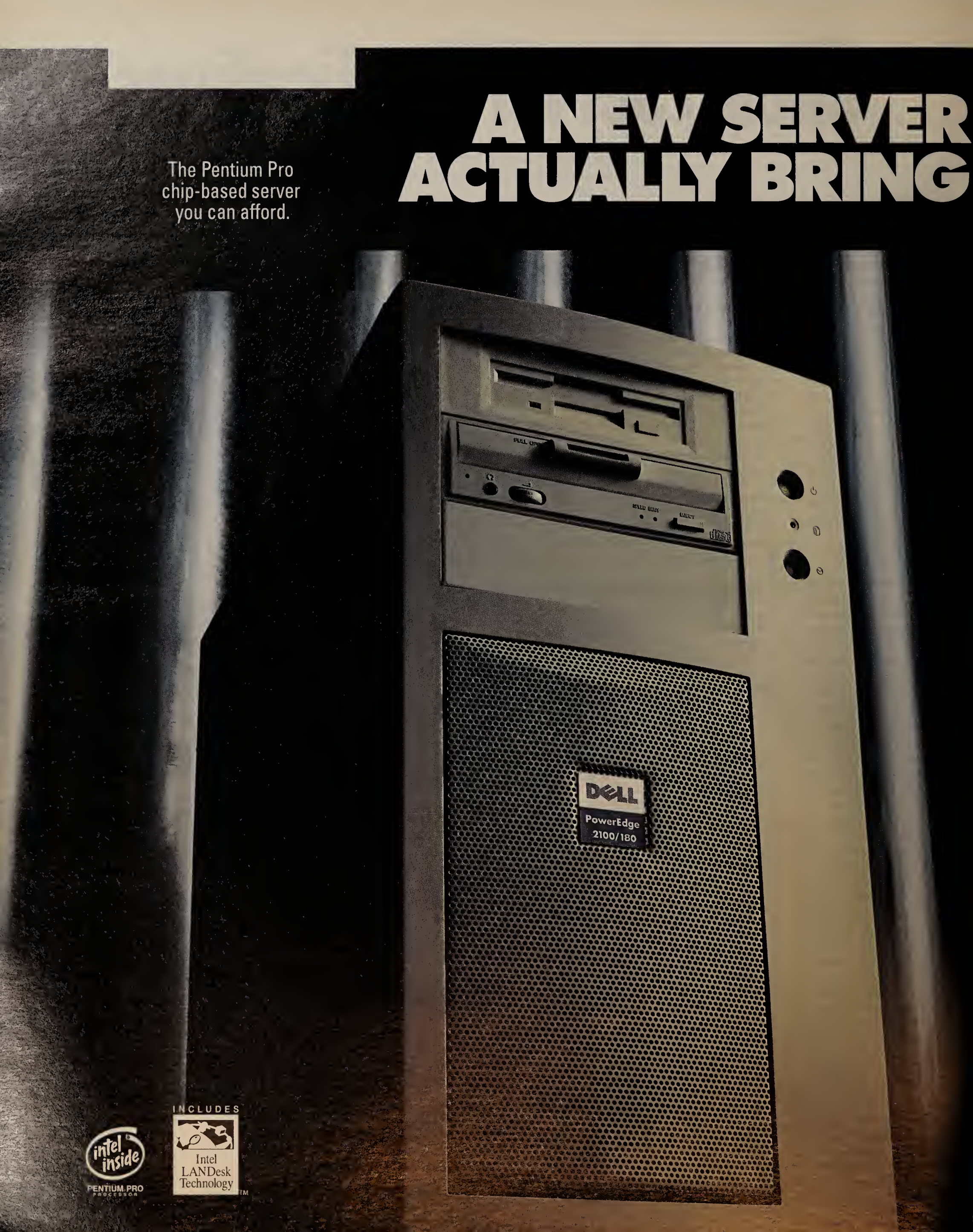

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GNARLED LOGIC

Challenge '97 — the X.500 push

As you think about deploying Lightweight Directory Access Protocol (LDAP) on your intranet, cast your gaze upward to the "sky" of the global X.500 directory.

Accessible to Web browsers and to LDAP clients, X.500 can let your internal users access E-mail addresses, digital certificates and other information about external organizations.

However, the coverage of the existing X.500 directory is quite thin, and much of the information is old or outdated. Essentially, the academic and research organizations that pioneered X.500 were able to put together top-down support for the standard, but they were unable to generate bottom-up user interest and market demand.

Directory Challenge '97 has been endorsed by the Electronic Messaging Association (EMA) organizations in North and South America, Europe, Australia, Asia Oceania and Japan. The user, vendor and service provider members of EMA are aggressively pursuing coordinated efforts to demonstrate X.500 interoperability and functionality at their 1997 annual conferences.

The first EMA Directory Challenge at EMA '97 in Philadelphia will demonstrate four applications using a live global directory infrastructure of Directory System Agents (DSA).

The applications include secure messaging based on Secure MIME (S/MIME) with X.509 certificates, a front end for retrieving electronic data interchange trading partner profile parameters for use by an EDI application, and a voice messaging application supporting phone number to E-mail address lookup through the directory. The General Services Agency will step up to provide a root X.500 DSA to synchronize national X.500 domain information among U.S. service providers.

Daniel Blum

I believe secure messaging is the most important of these applications. Secure messaging is a major requirement for both Internet and intranet messaging that is not being met today. Users of systems that do provide S/MIME and X.509 functionality are hampered by the lack of a global directory from which certificates can be obtained for use in the encryption of a message or the verification of a digital signature.

Using S/MIME with X.509 certificates in support of multiple vendors, Challenge '97 will demonstrate end-to-end verification of encryption, integrity and authentication services between multiple vendors. Once LDAP client and S/MIME support begins shipping from major vendors in mid-1997, Challenge may act as a catalyst for bottom-up demand, as well.

Enabling easy, ubiquitous registration and listing services is also critical. Currently, Challenge intends to support special ANSI registers of national organizations. Many experts also recommend long-term mechanisms for automatic cross-registration and optional listing of Internet Domain Name Service names into the X.500 name space.

With its broad, enthusiastic participation, Challenge '97 should succeed in establishing a new and improved top down X.500 infrastructure. What follows thereafter is more tricky (but worthwhile) work.

Blum is a principal at Rapport Communication, where he consults and writes on LDAP and X.500 issues. He can be reached via the Internet at dblum@mindspring.com.

Intranets & the 'Net

Covering: Internet Technologies and Services for Collaboration and Electronic Commerce

Briefs

■ **Microsoft Corp.** *recently announced availability of the second beta of its Commercial Internet System, formerly code-named Normandy, which includes a Personalization System to enable Web sites to deliver* **customized information** *to target audiences.*

Commercial availability is expected in the first quarter of 1997.

Microsoft: (206) 882-8080.

■ *Ottawa-based* **Chrysalis ITS, Inc.** *has started shipping a $300 PCMCIA card called Luna, a data*

encryption token that supports public or private key encryption and **digital signature operations.** *Chrysalis is also offering a $10,000 Luna Developers' Kit.*

Chrysalis: (613) 731-6788.

■ **The National Computer Security Association** *has released a list of 10 vendors'* **anti-virus products** *the Carlisle, Pa.-based trade association has tested for effectiveness. For more information, call (717) 258-1816.*

■ **Northern Telecom, Inc.** *last week announced a Web-based X.509 certificate authority issuance and management software product. Entrust/Web CA is for corporations that want to issue employees* **X.509 certificates as plug-ins** *that work with Netscape Communications Corp. or Microsoft Corp. Web browsers. Priced at $850, the tool is scheduled to ship in the first-quarter of 1997 for Windows NT.*

Nortel: (214) 684-8721.

■ **JetForm Corp.** *is developing a* **Java edition** *of its JetForm Design product so customers can download electronic forms using a Java-enabled browser rather than JetForm's proprietary software.*

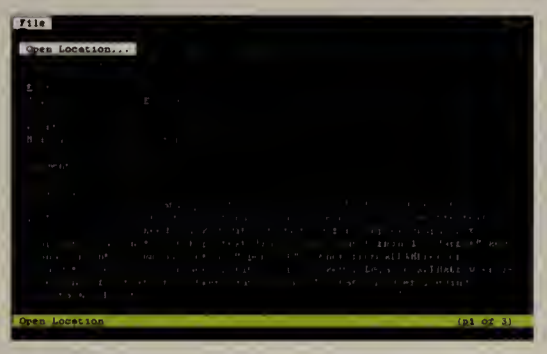
JetForm: (613) 751-4800.

AlphaBrowser gives dumb terminals Web text

By Carol Sliwa
Las Vegas

Just because the world's two most popular Web browsers cannot run on dumb terminals does not mean their operators should be totally deprived of the experience of surfing the Web.

With JSB Corp.'s Unix-based AlphaBrowser, shown at Comdex here last week, a user can display Web information on users character terminals. They will see text and tables; they just will not get graphics and frames.



JSB's *AlphaBrowser delivers text-only Web pages to dumb terminals not able to run standard Web browsers.*

"A lot of companies out there are looking to implement intranets, but they still have lots of dumb terminals," said Steve Jones, president and cofounder of JSB. "In an intranet, most of the information [companies] will distribute is text-based. So a character-based Web browser is a really useful animal for protecting their investments."

A 'Wyse' move

JSB has worked out a licensing agreement with Wyse Technology, Inc. that calls for the San Jose, Calif., hardware manufacturer to incorporate the AlphaBrowser in its intranet product line. Through the AlphaBrowser interface, users also will be able to send E-mail and download files via the File Transfer Protocol. A four-user license sells for $99. Customers making bulk purchases will be able to get the browsers for $20 each, Jones said.

Evaluation copies of the browser software can be downloaded free for a 30-day trial from Wyse's Web site (www.wyse.com).

The software runs on SCO Unix and IBM AIX platforms. Plans call for AlphaBrowser to be ported by January to HP-UX, Digital Equipment Corp.'s Alpha and Sun Microsystems Inc.'s SPARC, Jones said.

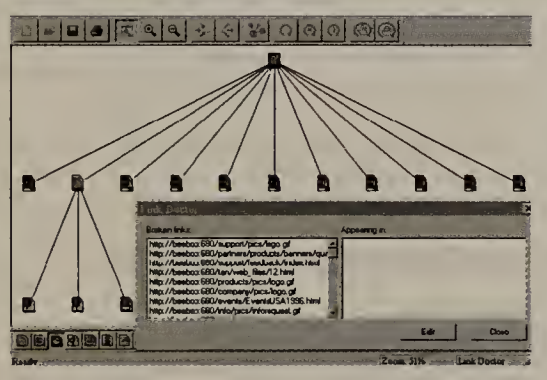
Jones Business Systems, Inc., of Houston, is distributing the product nationwide for Wyse.

✆Wyse: (408) 473-1200.

Mercury rises to meet Web management challenge

By Ellen Messmer
Sunnyvale, Calif.

Mercury Interactive Corp. next month will start shipping a Web management tool called Astra, which lets adminstrators view Web pages on-screen, detects and repairs broken links, and displays usage patterns.



Astra's Link Doctor *lets you detect broken HTTP links and repair them.*

Users now beta-testing Astra described the management tool, which runs on any Web server with Windows 95 or NT, as richly functional and easy to use.

The Astra client software includes an API plug-in so Web managers can add custom features. The tool ships in mid-December.

"We're giving Mercury Interactive feedback on the kinds of report formats we'd like, but if they don't include them, we could develop them ourselves with this API," said Wayne Sass, corporate supervisor of network architecture at PacifiCare Health Systems, Inc. in Cypress, Calif.

Mercury Interactive is seeking to outpace rivals InContext Corp., NetCarta, Inc. and Interse Corp. by cramming Astra with Web display functions such as a hub-and-spoke view of URLs and links, plus what Mercury calls "zoom-and-pan control."

This zoom-and-pan control, Sass said, is a picture within a picture that presents an overall map as well as details on your immediate view.

Zohar Gilad, Mercury Interactive's director of enterprise product marketing, said Astra can scan your Web site to diagnose problems. Another feature, called Dynamic Scanner, can record Web pages pulled from back-end databases.

"It maps these pages on the fly, just as though they were static pages," Gilad said.

Astra is expected to be priced at $495.

✆Mercury Interactive: (408) 523-9900.

Security

Firewall 'checks' out ODBC data

By Ellen Messmer
Redwood City, Calif.

Check Point Software Technologies, Inc. has spent the last three months packing extras such as URL filtering into its firewall. Now it is stuffing database connectivity into its flagship FireWall-1.

Check Point's *Chandra positions firewall for multiple encryption protocols.*

Under the assumption that the firewall manager might want to keep user information in existing corporate databases rather than one specific to the firewall, Check Point is adding support for Microsoft Corp.'s Open Database Connectivity (ODBC) protocol to its firewall.

According to Asheem Chandra, Check Point's director of business development, ODBC will allow Firewall-1 to store accounting and auditing data about users in any database supporting the data access protocol, such as those from Informix Software, Inc., Oracle Corp., Microsoft or Sybase, Inc.

Check Point is also adding support for the Lightweight Directory Access Protocol, so Firewall-1 can access user information from other LDAP-based directories.

In the area of encryption, Check Point is also adding support for the National Security Agency's Fortezza card, the IP security key management scheme for public key encryption called ISAKMP, and an ISAKMP alternative, called Simple Key-Management for Internet Protocols (SKIP).

"Vendors are starting to take sides on ISAKMP and SKIP, but we'll support both IETF protocols," according to Chandra.

✆Check Point: (415) 562-0400.

'NET INSIDER

How much is security worth?

An interesting advertisement came my way the other day. A company is now offering to recover a Windows NT administrator's password upon request.

They offer standard service (48-hour turnaround) for $990, overnight service (24-hour turnaround) for $1,890 and emergency service (four-hour turnaround) for $4,490. What is interesting is not, as the saying goes, that the bear can dance well, but that the bear can dance at all.

If I were consigning my corporate secrets to a Windows NT machine, knowing that someone with some expertise and "four Pentium Pro-200 boxes" (as the ad puts it) can break the security on the system would not make me sleep better.

I'm sure this company (http://www.omna.com/Yes/MWC/PRS-index.htm) is honest and would not help you break into my machine. However, they do guarantee "complete confidentiality."

In a related topic, researchers at AT&T have shown that with the right resources, it is quite easy to break 56-bit U.S Data Encryption Standard (DES) keys and the export-legal 40-bit encryption keys.

The paper (ftp://ftp.research.att.com/dist/mab/keylength.txt) shows how someone with an investment of less than a million dollars can build a hardware DES key-cracking machine capable of breaking DES keys in less than a day.

For an investment of a few hundred thousand dollars, an organization could build a device that could break 40-bit keys in less than a minute. An organization with greater resources could get the key-breaking time down to less than one-tenth of a second for 40-bit keys and a few tens of minutes for DES keys.

Scott Bradner

The National Security Agency (NSA) claims it is not quite so easy and has published a rebuttal of sorts (ftp://ftp.research.att.com/dist/mab/keylength.nsa).

Even if the NSA is right, and the cost is quite a bit higher today, the cost of cracking is bound to come down as processing speeds increase. In any case, protecting corporate secrets (such as expansion plans) seems to be a bad idea today and close to negligent in the near future.

There are many encryption algorithms that are far harder to break. The best known example is RSA. Estimates have been made that with current technology it would take billions of years — longer than our current understanding of the lifetime of the universe — to break a 1,024-bit RSA key. If you are in the U.S., you can get a copy of Pretty Good Privacy (PGP), which uses RSA to protect E-mail exchanges by filling out the form at http://bs.mit.edu:8001/pgp-form.html.

You do not need to always use longer keys. In Triple-DES, the text to be protected is encrypted using one DES key. The output is then re-encrypted using a second DES key, and the output of that operation is encrypted in a third DES key. The results are hard to break.

The bottom line is: Don't use two-bit encryption to protect the formula for Coca-Cola.

PGP key fingerprint: E9 B0 99 A3 B3 3E BC EB 23 8C 72 87 0E 3F B1 05.

Disclaimer: There ain't nothing two-bit about Harvard (especially Harvard's opinion of Harvard), but the above worries are my own.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached at sob@harvard.edu.

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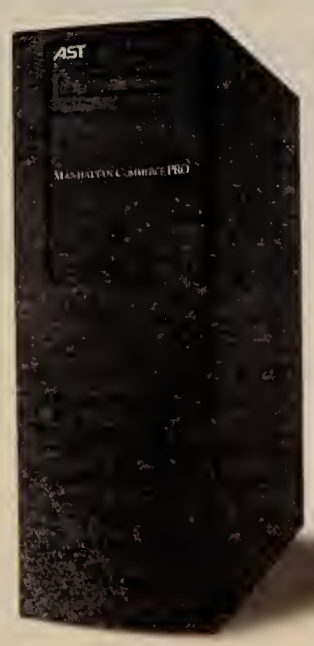

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Technology Update

Keeping Up with Network Technologies and Standards

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

I have a Novell, Inc. NetWare 4.1 Ethernet LAN with about 40 clients and 12 printers attached directly. I have one server — a 90-MHz machine with 80M bytes of RAM and seven volumes, totaling 5G bytes. Utilization is moderate, and cache buffers are open.

I want to add Cheyenne Software, Inc.'s FAXserve NetWare Loadable Module (NLM), but I'm worried that my server can't handle another large application. I've already loaded ManageWise, ARCserve6, a number of NetWare patches and a few other small NLMs. Do you think it's time to separate these applications, perhaps dedicating a server for ManageWise and FAXserve?

Fred Katsumi, Chugai Boyeki (America) Corp., N.Y.

You have a valid concern. Here are a few things you can do to figure out if you should add another server.

First, look at the server's CPU utilization. If it is consistently in the 50% to 60% range, that's an indication that you might want a second server to spread the load.

Second, check out the memory. All you may need to do is add some memory to help with server performance. Look at the cache buffer's percentage number in Monitor.NLM. With all NLMs loaded, this figure should be 60% or higher. A higher percentage will help keep the server responsive to user needs.

If your server utilization isn't high and you still have room to add RAM to the server without having to remove memory (for example, remove a 32M-byte RAM kit to get 64M bytes of RAM), then you shouldn't have a problem adding FAXserve. If you install another server to support FAXserve and ManageWise, be sure the latter NLM is licensed on a per-server basis, depending on the number of users supported. You'll lose your antivirus protection on the original server because you will have to de-install the product on that server and install it on the second server.

Peer relationships can make all the difference on the Internet

Internet service providers can exchange traffic more efficiently through peering centers.

By Robert Berger

When you sign on with an Internet service provider, you expect it to be able to provide connectivity among your users and anyone else on the 'Net, nationally or internationally. You might not realize, however, that the prices you pay, and the quality you get, depends heavily on the techniques an ISP uses to establish those end-to-end links.

Many ISPs connect to national service providers (NSP) and use those backbones to route packets to Internet sites outside their network clouds. This method is not only expensive, but inefficient — even local traffic may go through many hops, each of which can introduce delays or congestion, before a packet is delivered.

Where the networks connect

International, national, regional and local ISP backbones exchange packets via peering centers. A service provider that connects its network to a peering center must agree to set up its routers so they can exchange traffic with routers on a peer network. Peering allows the customers of each network to communicate directly.

ISPs have two peering options: They must contract for peering coverage throughout the country on their own, or they must buy transit peering from an NSP that has complete peering coverage.

In the U.S., the Internet comprises two major types of peering centers: metropolitan-area exchanges (MAE) and network access points (NAP). You should be familiar with the approach your ISP uses.

MAEs employ FDDI switches for high-end connectivity and shared FDDI/Ethernet for lower volume peers. An MAE member has to negotiate peering agreements with every other member to have complete peering coverage.

MAEs provide great flexibility and quick peering setup. However, security is low because anyone attached to an MAE can snoop on traffic being transmitted over the Layer 2 FDDI connection. In addition, because members don't have to follow any management rules or meet any qualifications, an ISP could introduce errors that could crash MAE networks.

Many NAPs employ ATM technology, which scales better than FDDI, and require customers to connect at the T-3 rate (45M bit/sec) or higher. The NAP operator establishes permanent virtual circuits (PVC) between peers.

The use of ATM technology and PVCs makes the NAP approach more secure than the MAE plan, because only those with peering relationships can see each other's traffic. However, connecting to a NAP is more expensive and requires greater networking skills than connecting to a MAE.

An ISP can provide better and more robust service when it connects to multiple peering centers and has many peering relationships with other ISPs and NSPs. The goal is to reduce the number of route hops and increase the availability of alternate routes, should one center or NSP fail.

Peering relationships can be particularly important for international connectivity.

Service providers have established close to eight peering centers in Europe and eight in Asia, so a domestic ISP with peering relationships can get its customers into another country with a minimum number of hops. Service within another country, however, can be quite different from service in the U.S.

International peering centers generally connect to their customers via circuits operating at E-1 speed (2M bit/sec) or slower. Links to the U.S. are usually at T-1 or subT-3 rates and are expensive. Traffic often clogs these low-speed international links and delays service for overseas customers trying to access information on Web servers that reside in the U.S.

Web server mirroring can provide a solution to this problem. The content of U.S. servers can be mirrored on local server farms that are colocated with or connected to international peering centers. By letting overseas Internet customers access U.S. information locally, mirroring can significantly reduce international traffic and improve network performance.

Peering pluses

Peering centers are a core Internet mechanism that allow network providers to route traffic cost-effectively and efficiently. ISPs with peering relationships can aggregate traffic to and from corporate enterprise networks, reducing network latency and improving performance.

The more peering centers, the better the meshing capabilities and the more routes among sites and backbones. This increased connectivity leads to improved Internet performance and reduced backbone traffic.

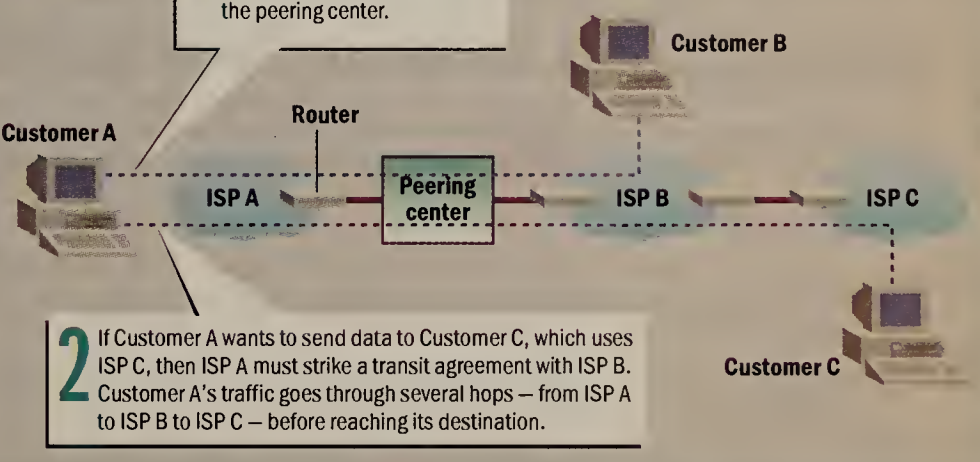
Before you sign on the dotted line, you should check an ISP's Internet connections. Corporations with a great deal of transcontinental and international traffic will obviously benefit by using an ISP with peering center relationships. But even small Internet users have something to gain because connection to a peering center greatly reduces the number of hops needed to reach a even a nearby location.

Berger is chief technical officer at InterNex Information Services, Inc., a Santa Clara, Calif., Internet technology company. He can be reached at (408) 327-2290 or via the Internet at rberger@internex.net.

HOW IT WORKS

The benefits of peering

Internet service providers exchange traffic via peering centers. The more direct ISP connections to a peering center there are, the more efficient the transfer of traffic from one network to another is.



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Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Beth Schultz by phone at (773) 283-0213 or via the Internet at bschultz@nww.com.

EDITORIAL *insights*

With network computers, you'd better look upstream

What is it about Comdex that inspires such an odd mixture of hyperbole and trivialization?

It's virtually impossible for someone to write about the show without such grandiose verbiage as the "gargantuan annual computer industry trade show." (This approach has become standard journalistic shorthand. You recall those "reform-minded" Polish unionists who toppled communism and the "freedom-loving" Afghan rebels who sent the Soviets packing?)

At Comdex time, we're also treated to such fascinating nuggets of information as the following from *The Wall Street Journal:* "More than 200,000 people are expected to attend, making the hypercrowded show the nation's 77th-largest city for the five days of its run." (Is NetWorld+Interop temporarily larger than Forked River, N.J., or Cheboygan, Mich.?) This is taking a page from sportswriters, who love the obscure stat. It's the equivalent of knowing that Jerry Rice holds the record for one-handed catches in away games where the 49ers trail in the third quarter.

Yet, for all its grand scale, people want to reduce Comdex to a single theme. While there are thousands of companies and products exhibited, people want to focus on the One Big Thing. This year, it was the network computer, with pundits saying Comdex was the place all the NC advocates had to put up or shut up.

Nonsense. Proving that the NC works is trivial. This is no moon landing, folks. It's a stripped-down computer.

Proving the *value* of the NC is another story and one that has gotten precious little attention. Analysts tell us it costs roughly $6.2 million a year to manage each desktop (OK, fill in your own inflated figure). So you'll save plenty by moving to NCs, right? Not so fast.

Could your network handle the traffic NCs will spawn? Tough to say since no one is really predicting how much traffic patterns will shift. How much will it cost you to train end users on these things? The change isn't transparent. How much to train help desk staffers and network administrators to deal with new problems? How much to train or hire developers to build and support new server-based apps? Got a ready team of Java developers on-site? Didn't think so.

Speaking of servers, will yours buckle under the added load? Can you say "new, clustered, symmetric multiprocessing machines?" How much will you shell out for new server software (office suites, new databases, etc.)? Why do you think Oracle loves NCs?

NCs may actually save you money. But look at this "paradigm shift" the right way — upstream from the desktop. Don't jump on this boat until the pundits come up with better information on what the impact of all those upstream changes will be.

John Gallant, editor in chief jgallant@nww.com

Internet issues • Ira Hertzoff

Cookies are not always a treat for Web users

Some Web sites, such as one I visited last week, act like they were built by an honors graduate of the Cookie Monster School of Web Site Design.

Web cookies are lumps of information that a Web site stores on an end-user's computer. There are three main cookie types: the good, the bad and the ugly.

The good Web cookie is one used only to customize the display of a Web page to suit the user's browser. To accomplish this, the Web server needs information about the client browser, so the server downloads the cookie onto the client computer's hard disk. The cookie is uploaded whenever the user visits that Web site. Since the Web site can identify specific users, a user can select the contents of a personalized page display, such as news, stocks or sports.

The bad Web cookie is one used to track a user's movements on a Web site, mainly to collect information for marketing purposes. This information can then be matched against other marketing database files and used to generate telemarketing calls, or junk E-mail or paper mail. This is annoying and an invasion of privacy.

One thing a Web site always knows is your TCP/IP address. Building a database combining that address and your Web activities is child's play. This may not concern users who browse only work-related sites, but it could be very embarrassing to those who suddenly find themselves being publicly linked to less savory Web sites.

The ugly Web cookie is one that could be dangerous. For example, it may be possible to create a virus-like cookie that could wipe out a user's hard drive.

Until cookies are proven not to be hazardous to my computer's health, I prefer to accept them only when essential, and only from trusted Web sites. Unfortunately, in most cases, a user must accept the cookie in order to get a proper page display.

Only the newest Web browsers, such as Netscape Communications Corp.'s Netscape Navigator 3.0 and Microsoft Corp.'s Internet Explorer 3.0, give users even minimal cookie information and the option of cookie rejection. In Internet Explorer 3.0, the message sent to the user is: "You have received a 'cookie' (Internet information stored on your computer) from site.com. The contents are: ID=4e364b3. [The string can be one to hundreds of characters.] It expires on Wed., 16 Sept. 1999, 12.00 GMT. Do you want to accept it? If you click 'No,' the page you are trying to view may not display correctly."

After rejecting 50 cookie requests from the overzealous Web site I visited last week, I must have reached its limit. The site stopped asking, and displayed the page I wanted to see. However, I don't think I will visit that site again. It's not worth the effort to dodge that many cookies.

I would like any Web site I visit to put all its cookies on the table and disclose what they are, what they do and what they are used for. Web sites, for example, should always disclose the use of personal or corporate information for any purpose other than controlling the display of the page. In addition, cookie control should be integrated with other security measures, such as site certificates, which are used to positively identify sites as being what they claim to be.

You should establish a policy requiring Web page displays even if the end user rejects the cookie-enabled features. As a Web user, I want to select which cookies are downloaded onto my hard drive. Browsers that allow users to reject cookies are a step forward. However, without meaningful information on what the cookie is used for, users still lack the ability to protect themselves from being force-fed.

Network managers, Internet server vendors, browser vendors and Web sites should prevent anti-cookie hostility from overshadowing the useful aspects of cookies. Disclosing what a site's cookies are used for allows users to pick the ones they want. Don't make us toss all cookies because we can't tell the good from the bad and the ugly.

Hertzoff is a consultant and writer based in Columbus, Ohio. He can be reached via the Internet at ihertzoff@ attmail.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

Pixel problems

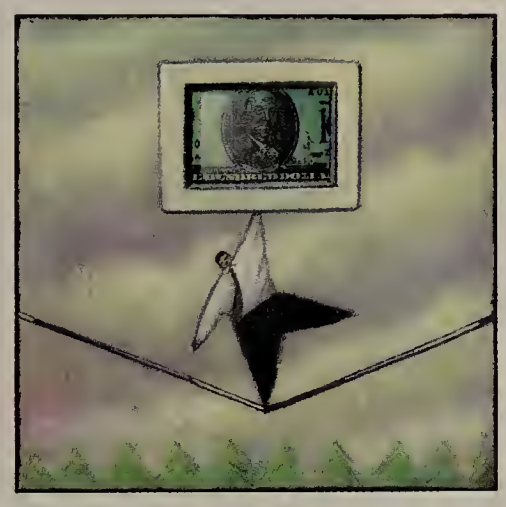
In a recent column, Mark Gibbs asked for reader feedback regarding dead or overactive pixels on active matrix screens (Oct. 21, page 70). Here are some of the responses he received:

Apple Computer, Inc.'s official response is that a screen is not dead until five or more pixels are stuck, unless they are stuck white in the center of the screen (at least that's what I have read in Macintosh-oriented magazines). Hewlett-Packard Co. has told me that its official policy is three defective pixels, but they will replace a screen with one dead pixel if the customer insists. Clone-type manufacturer Twin-

3Com may be the ATM sleeper

Everybody knows Cisco Systems, Inc.'s ATM position, or Cascade Communications Corp.'s, or even IBM's. Meanwhile, users who are asked about 3Com Corp.'s ATM policy have tended to answer "Three-who?" But 3Com's recent announcements, coupled with past and unrecognized ATM achievements, may indicate that good old NIC-selling, Ethernet-loving, second-tier 3Com is up to something big.

Of all the network and internetwork vendors, 3Com has relied the most on indirect sales. This approach traditionally has been the secret to market success for products too inexpensive to be sold via a commissioned sales force. For this reason, Cisco and other vendors that have long taken the direct sales route have been forced to adopt indirect channels for their lower end products. But 3Com is the industry-acknowledged master of the indirect channel, the one that consistently scores best in surveys. Remember: Indirect equals 3Com.



Though they haven't gotten a lot of publicity, the 3Com channels have been reasonably effective in selling the 3Com CELLplex ATM switches. One reason is that some pretty big firms, including major carriers, are 3Com resellers. The term value-added reseller (VAR) conjures up the image of a part-time datacommunications organization with collateral business mowing lawns or delivering fuel oil — but that's not so. VARs are successful because they bridge the gap between product complexity and user capability. ATM sure looks like prime gap territory to most buyers, so VARs should be a good channel for ATM premises equipment sales. VAR ATM success equals 3Com, too. Next, consider the fact that carriers are finally acknowledging that ATM at a couple hundred million bits per second isn't exactly populist networking. Carriers such as Pacific Bell and Ameritech Corp. are now promoting ATM at the T-1 level. Their theory, a good one, is that companies can't be expected to build ATM applications without having ATM at a bunch of their locations. T-1 ATM would be affordable even in branch office applications — T-3 or OC-3 ATM is not.

Cheap ATM is good. Low cost is a driver toward indirect sales channels, which 3Com is a market-acknowledged master in supporting. Getting the picture? Wait, there's more.

The latest 3Com products (announced Nov. 12) are T-1 ATM and T-1 ATM Inverse Multiplexing access adapters. The lowest end model, the AccessBuilder 9010, costs less than $6,000 retail. This price makes it possible for ATM-hungry carriers to bundle the box with T-1 ATM services and offer the combination to buyers for $400 per month or less, including analog voice connection with the central office switch. In other words, ATM integrated access will be a reality. Many of these ATM-hungry carriers are 3Com VARs already. Coincidence, huh?

Better yet, the new model AccessBuilder products have been delivered in a SuperStack II form factor. While the initial models don't connect directly to the SuperStack II bus to exchange data with other LAN modules, it is clear that future versions could use other SuperStack modules to provide LAN links. That would make the AccessBuilder a very versatile player in the carrier-transparent LAN or ATM LAN market. But even today, integration of the data paths of a SuperStack II hub with the new AccessBuilder line would be a simple cable connection.

Best of all, the new AccessBuilders also have a killer feature — traffic shaping. Low-speed switched ATM connections have been creating problems for some early VARs and users because switches don't buffer traffic. When a bunch of fast ATM or Ethernet ports gang up on a relatively slow trunk connection, the collision of data can result in so much discarding that effective throughput goes to zero. The new 3Com boxes will perform traffic shaping even on virtual circuits using the ATM Unspecified Bit Rate class of service, reducing the discarding that is all too common in most ATM and Ethernet switches with slow trunk ports.

3Com, it seems, has both sales channels and product capabilities going for it. What more could you ask for? Well, how about competitors' growing disinterest in the ATM market? It is now clear that ATM won't displace current LANs (there was never a chance it would), and many companies are positioning themselves more in the switching space than the ATM space. What choice will ATM buyers have when the big names pull back? How about 3Com?

3Com's eager little channel beavers could rush into the ATM vacuum and capture a big chunk of the ATM premises and wide-area market. For years, we've tended to focus on the technology of networking and ignore the business of networking. No product can be successful if there isn't a sales conduit between it and the buyer. No sales message is more easily conveyed than "You can afford it." Maybe 3Com is about to teach us a lesson.

Nolle is president of CIMI Corp., a technology assessment firm located in Voorhees, N.J. He can be reached at (609) 753-0004 or via the Internet at tnolle@cimicorp.com.

head Corp. refused to take back a screen with 10 dead pixels in it, stating that IBM's policy was 20 pixels. I contacted IBM, and its policy is actually closer to Apple's.

The stuck pixel thing is a byproduct of the manufacturing process for the active matrix screens. If the screen manufacturers threw out every screen with a stuck pixel, their yields would be prohibitively low. This yield problem is one partial explanation for the more than $1,000 difference in price between laptops with active matrix screens and those with dual scan.

John Jolet
Systems analyst
Kings County
Fresno, Calif.

For the amount of money we pay for an active matrix screen as part of our laptops, we should have zero tolerance for dead pixels. I say, "Send it back!" These manufacturers will get the "picture" if more and more pixel predicaments come flying back at them as returns.

Keith Ward
MIS manager
L.I. Head Start Child Development Services, Inc.
Patchogue, N.Y.

If the laptop makers advertised the fact that a few pixels might not function properly, then I wouldn't have a problem. Otherwise, you might have a breach-of-contract argument.

However, from a legal perspective, I believe the determining factor as to whether a screen is defective and in violation of warranty or contract would be whether the pixels constituted a "material" defect. For example, 10 bad pixels on the far right edge of the screen might be unnoticeable and, therefore, not material; whereas one defective pixel in the middle of the screen might be so annoying as to render the screen unusable.

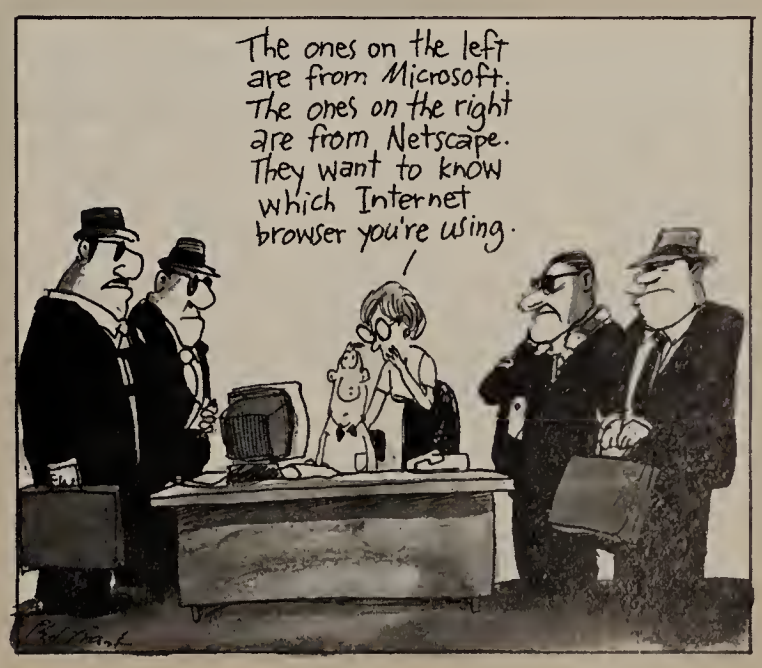
By the way, there is one advantage to having some inoperable pixels on your laptop. Just two weeks after I purchased my notebook computer, it was stolen. If it ever turns up again, those two pixels are like a fingerprint.

Brian Youngerman
Editor
The Sports Bar Online Sports Forum & Newsletter
Philadelphia

For two years, I served as the primary workstation technologist for one component of a Fortune 100 company. During that time, we purchased close to 100 active matrix laptops from several Tier 1 and Tier 2 vendors. It was common to get a laptop with one or two defective pixels. However, most of the laptops had perfect screens. I imagine this problem is related to the defect rate in producing transistors on a silicon substrate. An active matrix LCD uses as many as four transistors per pixel, so a typical 800 by 600 screen may have nearly two million transistors! A defect rate of one in a million sounds pretty good to me.

Michael Stangel
Research assistant
University of Illinois at Urbana-Champaign

Teletoons



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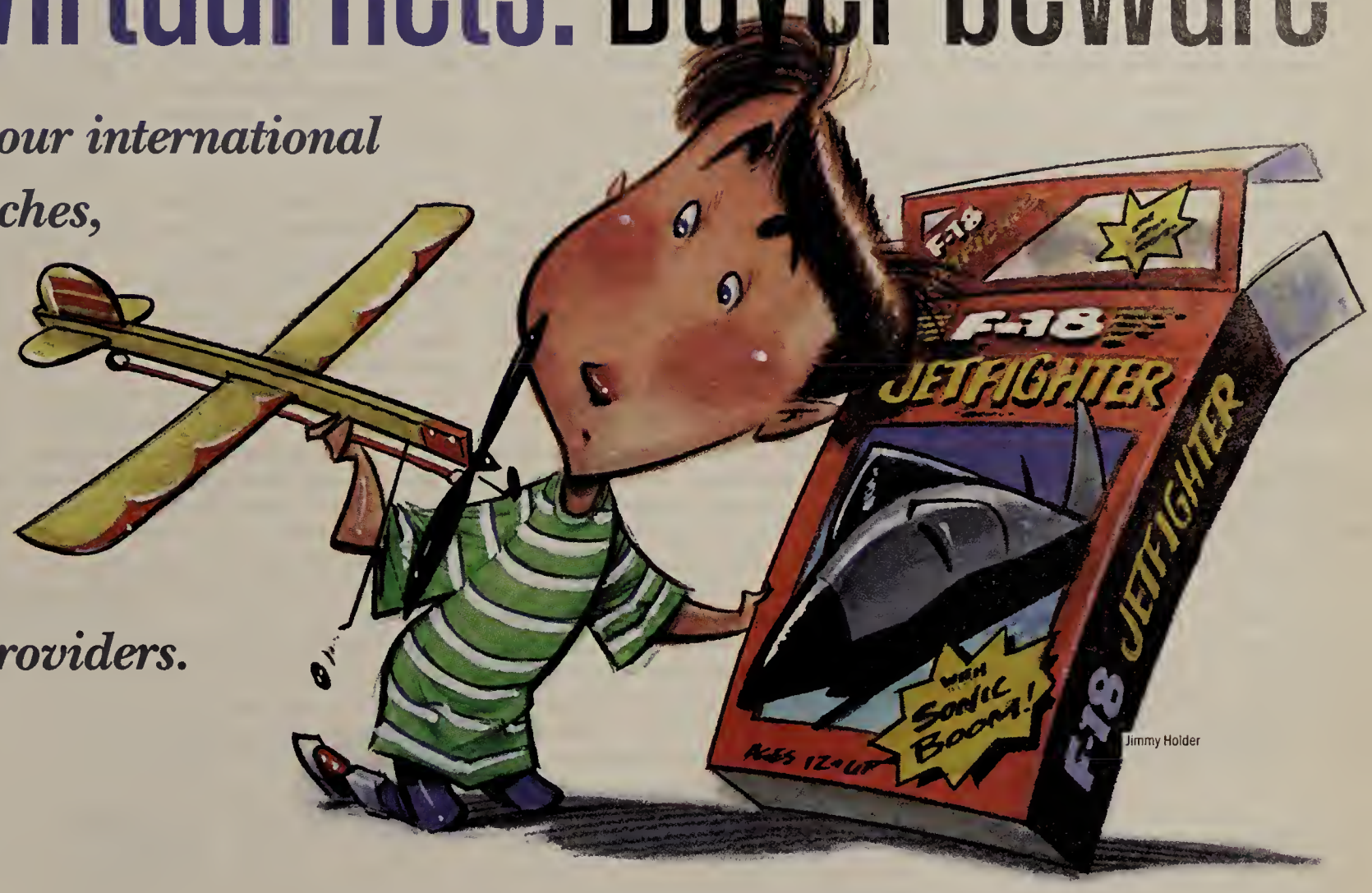
Feature

Global virtual nets: Buyer beware

They can reduce your international networking headaches, but you've got to make sure you know what you're paying for. Here's our guide to the global net providers.



Jimmy Holder

By Ellen Clifford and Melodie Reagan

While only a short time ago global virtual private networks (GVPN) were an idea with no basis in reality, today not only can you get one, you can choose between multiple carriers to provide it. That said, it's strictly buyer beware. What you're sold is not necessarily what you get, and what you're paying for may be just the provider's learning curve.

AT&T was the Lewis and Clark of GVPNs, exploring and charting the virgin territories of international networking. Bearing the brunt of the learning curve, it has solidified its leadership position while serving as the example to learn from in terms of GVPN dos and don'ts. But Concert, the joint venture between MCI Communications Corp. and British Telecommunications plc, and Global One (a consortium that includes Sprint Corp.) are giving the blue chip a run for its money. Rounding out the field is the venerable Cable & Wireless, Inc., which is poised to enter the fray. All purport to offer efficient and cost-effective worldwide data and voice communications.

Promises, promises. Can we say, "clear as mud?" GVPN shoppers need special tools for evaluating the carriers' services, such as decoder rings and X-ray glasses. GVPN services should be fairly easy to describe and provision, but anyone who's waded through the tariffs and marketing literature can tell you that you'd have a better shot at finding the Holy Grail than making an apples-to-apples comparison. The carriers, for the most part, seem to like it that way. Throwing as much confusion into the mix as possible allows the providers to blur their services and features in weak areas.

AT&T now finds itself in the unenviable position of trying to defend its rather shaky ground against competitors for which it paved the way.

We've cut through all that and can offer this assessment of each provider's strengths and weaknesses, plus some guidance on features that differentiate the contenders.

What is a GVPN?

In the beginning, there were private networks. But as technology continued to evolve at the speed of light (pun intended), businesses were given the option of buying a VPN from their carrier of choice instead of maintaining a private net on their own. VPNs offer most of the same features and functionality as private networks, and in some ways more, but utilize the public switched telephone network (PSTN) for transport. Using the PSTN provides better economies of scale as well as inherent redundancy. VPNs are created and supported by enhanced software and intelligence in the network, and these capabilities have recently extended to cover international service, thus giving birth to the GVPN.

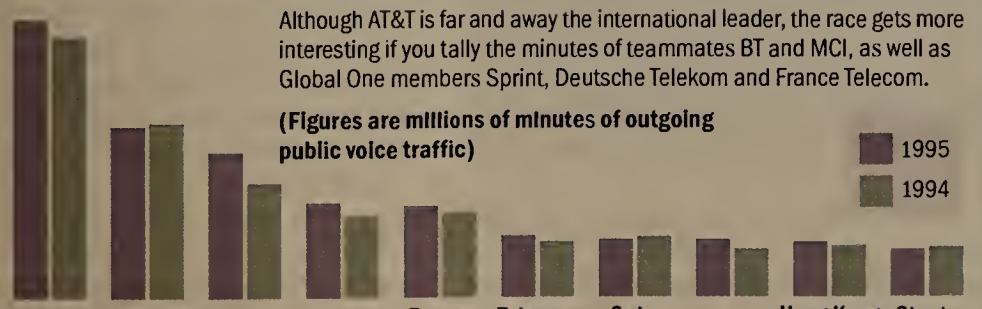
There are two types of GVPN services — bilateral and multilateral. Bilateral services are provided between two separate carriers, such as AT&T in the U.S. and BT in the U.K. The customer must purchase separate virtual network services from both carriers, then interconnect them. In general, there is no single point of contact for the management of these services, and there are separate billing and network management systems for each carrier.

Because each carrier has its own network platform, functionality is restricted to features and intelligence that can be handled by one end of the call, such as screening and abbreviated dialing;

THE TOP 10 INTERNATIONAL CARRIERS

Although AT&T is far and away the international leader, the race gets more interesting if you tally the minutes of teammates BT and MCI, as well as Global One members Sprint, Deutsche Telekom and France Telecom.

(Figures are millions of minutes of outgoing public voice traffic)



	AT&T	Deutsche Telekom	MCI	BT	France Telecom	Telecom Italia	Swiss PTT	Sprint	Hong Kong Telecom	Stentor (Canada)
1995	8,482	5,244	4,452	2,909	2,805	1,908	1,778	1,765	1,692	1,457
1994	7,947	5,347	3,517	2,488	2,603	1,708	1,849	1,471	1,578	1,525
Change	**6.7%**	**1.9%**	**26.6%**	**16.9%**	**7.8%**	**11.7%**	**7.8%**	**20.0%**	**7.2%**	**-3.8%**

SOURCE: TELEGEOGRAPHY, INC., WASHINGTON, D.C.

there's no interaction of the two networks at an intelligent level. Additionally, features are restricted to the lowest common denominator found on both virtual network services. For example, if one network supports five-digit account codes and the other supports 10-digit codes, the GVPN will use the lower of the two — five digits — to enable uniformity across the network.

These limitations, of course, rule out a great number of virtual network functions that require interaction between the front end of a call (call setup) and the back end (call delivery). For this level of functionality, you must choose a multilateral solution.

For carriers, the key to offering a multilateral GVPN is having a global intelligent network structure in place, generally based on a common network platform and offered through alliances and partnerships. Using a common platform, providers can communicate at a higher level of intelligence; service offerings can be determined on a uniform basis across different countries; coordinated billing and management are available; and centralized service ordering and trouble handling are options. All four major players offer or, in the case of Cable & Wireless, will soon offer a multilateral service.

BALANCE OF TRADE

In terms of average total minutes, twice as many calls are made from the U.S. to other countries, compared to calls made from other countries to the U.S., according to TeleChoice in Verona, N.J.

The contenders

AT&T is the leader in the marketplace — having been first out of the gate — but now finds itself in the unenviable position of trying to defend its rather shaky ground against competitors for which it paved the way.

Deploying a two-pronged approach, the multinational conglomerate offers its Global Software Defined Network to customers that only need a bilateral service, and turns to its WorldPartners group for multilateral provisioning. WorldPartners is an association of 16 carriers from around the world that was formed to provide voice and data communications services internationally under the name of WorldSource services. AT&T holds a majority stake in the group (40%), with Kokusai Denshin Denwa Company, Ltd. of Japan, Singapore Telecom and European consortium Unisource being the remaining equity partners.

Where your company's headquarters are located frequently determines which carrier handles your WorldSource GVPN service. U.S.-based companies are handled by AT&T's global account teams as a default, although the customer has the option of choosing any office for its main contact. That eliminates a common problem for multinational companies — having to deal with the different partners and coordinating service across borders and time zones. One of the clearest advantages offered by AT&T is its relationships with foreign service providers in markets, such as Singapore, that aren't yet open to competition. These relationships reduce local connection time and hassles, and enable more seamless service management because you deal only with your central contact.

Hard on AT&T's heels is Concert Communications Services (CCS). MCI and BT's CCS launched its global virtual network service in November 1994 and has since been steadily pumping out features. Using the presence and experience of its founding companies, CCS is quickly becoming a force in the international services market, offering managed data services, GVPN services, integrated access service and global support. It supports 3,000 corporate customers with more than $1.5 billion in revenue under contract.

MCI's major account teams handle multinational customers based in the Americas, while BT and its partners manage accounts located in other parts of the world. Features such as 10-digit numbering plans, closed user groups and authorization codes that enable you to access your GVPN from off-net locations have given Concert an edge.

That said, the blending of MCI and BT sales and marketing cultures poses an ongoing challenge. The disparate sales force and distributor channels tend to confuse customers and hamper CCS's ability to get new services to market efficiently. In short, the sum of the parts is not yet greater than the whole.

But the two companies have complementary strengths and weaknesses, which makes for a beneficial union. It's so beneficial that on Nov. 3, they announced a full merger. The new company, to be known as Concert, will have more than $42 billion in annual revenues, 183,000 employees and 43 million business and residential customers in 72 countries. CCS will still exist as a subsidiary and offer its full range of services, but with a parent such as Concert, it will have ample resources to enhance its GVPN offering and continue to give competitors a run for their money.

The disparate [BT and MCI] sales channels tend to confuse customers and hamper [Concert's] ability to get new services to market... The sum of the parts is not yet greater than the whole.

Just springing into action this past January is Global One. This latest entrant to the global service provider league is a combination of the two largest European post, telegraph and telephone administrations (PTT). France Telecom and Deutsche Telekom, with the international division of the No. 3 U.S. carrier, Sprint. Global One is scurrying to get a toe-hold in most of the world's markets. Restricted from further expansion of its existing systems by European regulation, the company has been focusing its efforts in the Pacific Rim as well as South America, with plans to install points of presence and establish relationships around the world.

Playing catch-up, Global One has been aggressive in its sales and marketing of services, making lots of promises. But it has limited capabilities, offering only basic functionality at this time (see graphic). Focusing on acquiring market share and creating a name for itself as a big player, Global One's strategy seems to be selling at cost (this doesn't mean inexpensive) to its significant customer base and providing excellent support for the limited feature set while burning the midnight oil to construct a tighter, more comprehensive end-to-end GVPN solution that will give competitors a run for their money.

Cable & Wireless, the understated, yet elegant, business-only service provider, has finally decided to leverage its wide-reaching, experienced, well-connected parentage and enter the GVPN market. What took it so long?

The carrier has the potential to be a serious contender due to the strength and coverage its parent, Cable & Wireless PLC, enjoys with its worldwide presence. A PLC initiative, the Global Intelligent Virtual Network (GIVN) project will support the core GVPN services necessary for the company to compete with the Big Three when it is launched in January.

Sharing resources and information across company borders has been a chronic challenge for Cable & Wireless, and the success of its GVPN initiative will depend heavily on its ability to coordinate resources. The relationships with local PTTs and partner organizations, along with the solid infrastructure already in place, will aid the carrier in its quest for market share.

Figuring out the features

The key to understanding what you need and what you get, as far as network capabilities and features, is knowing what is ubiquitous across the network. The U.S., having the most advanced telecommunications environment in the world, is the most fertile ground for GVPN services, and these global providers sell their domestic capabilities heavily.

Unfortunately, while the U.S. provides a rich hunting ground for multinational companies needing GVPN services, the majority of the actual traffic originates and terminates outside of this country. This can result in disappointment if a user in Rochester, N.Y., expects to have the same dialing and access capabilities when temporarily stationed in Stuttgart, Germany. An understanding of some of the key features and how they are provisioned is the necessary starting point for determining a carrier's capability.

Access

Access is how you connect to your carrier's GVPN from your office, and the four carriers handle it similarly. All offer dedicated access from your site to the network. Switched access is offered uniformly in the U.S., but very rarely in other countries. It requires the use of an access code or special dialing sequence.

Global One's direct access can be achieved through different types of connections (analog or digital), the most common being full or fractional E-1/T-1 service. The company also supports connections to a wide range of communications equipment, including financial trading systems.

Cable & Wireless supports direct-dedicated and shared-dedicated access. The

GVPN CHECKLIST

	Global One Sprint	Concert BTMCI	World-Source AT&T	Global Intelligent Virtual Network Cable & Wireless
Access				
Direct dedicated	●	●	●	●
Direct shared		●	●	●
Switched	●	●	●	●
Private network interface	●		●	●
56/64K bit/sec digital switched data				
Primary Rate Interface		●	●	●
Basic Rate Interface			●	
Features				
Private numbering plan	●	●	●	●
▶ Seven digits	●	●	●	●
▶ 10 digits		●		
▶ Variable	●	●		●
Virtual on-net	●	●	●	●
Forced on-net	●	●	●	●
Account codes	●	●	●	●
Global VPN calling card	●	●	●	
Global call center	●	●		
Management reports/invoicing	●	●	●	●
Customized messaging				
Call screening/barring		●	●	●
Time-of-day routing	●	●	●	●
Network remote access	●	●	●	●
Security				
Closed user groups		●		●
Authorized codes		●	●	●

direct-dedicated supports inbound and outbound on-net calls, whereas shared-dedicated access supports not only all on-net calls, but outbound off-net traffic, as well.

Concert offers dedicated and shared-dedicated access universally, with switched access only recently being an option — even in the U.S. The distributor relationships Concert enjoys with 30 countries gives it a definite advantage in the installation and maintenance of dedicated connections for on- and off-net traffic.

AT&T WorldSource offers dedicated, shared and switched access capabilities. Shared access can save you money by allowing you to use the same access connection to support both your GVPN and other services. Due to the way WorldPartners is organized and the way accounts are coordinated and managed, there can be a lag in the time it takes for dedicated lines to be installed at company locations. If there is a delay, customers can utilize AT&T's remote calling service, enabling them to use their AT&T calling card and receive GVPN rates.

Global One has been aggressive in its sales and marketing of services, making lots of promises. But it has limited capabilities, offering only basic functionality.

Numbering plans

One of the key advantages companies enjoy with private networks is the ability to pick up the phone and dial a five-digit number to reach a coworker in another hemisphere. The four main carriers have emulated this capability by offering tailored numbering plans for all on-net calling.

Global One offers private numbering plans across all locations using either seven or 10 digits.

Cable & Wireless's dialing plans are more flexible, allowing you to choose any mix of variable or fixed-length dialing plans using four to 10 digits.

Concert offers two to 15 digits across all locations, and you can specify a different length for each location. WorldSource Network Services includes a seven-digit universal dialing plan that emulates the domestic AT&T Software Defined Network (SDN) feature.

On-net calling

The biggest savings come into play when a call is carried solely over your virtual private network. On-net calling means just that, and there are a number of ways to ensure that calls don't stray.

Concert has the most comprehensive offering, supporting various calling plans: forced on-net, virtual on-net, remote on-net and on-net calling with the Concert VNS card. With virtual on-net calling, customers can add frequently dialed off-net numbers to their private dialing plan, making them as easy to dial as on-net numbers. With remote on-net calling, the Concert central database allows traveling employees to use the company's private dialing plan and other features from any country where the network can be reached. A company can tailor individual user privileges for employees who routinely access the network remotely, and monitor and control their usage of the network. And MCI's WorldPhone calling card allows these employees to access the corporate network as well as make direct-dial calls worldwide.

Global One supports the same features, although it doesn't allow remote on-net calling outside of Europe.

AT&T's WorldSource supports the domestic SDN feature set for on-net calling, which in-cludes forced on-net calling, virtual on-net and on-net authorization codes. Cable & Wireless is offering virtual on-net and forced on-net initially with its GIVN and plans to offer a universal 800-access capability.

While voice services make up the majority of traffic on virtual networks, the advent of ISDN has opened the way for data to utilize the advantages of a GVPN. AT&T, Concert and Cable & Wireless are the only carriers that support Primary Rate Interface Nx56/64K bit/sec digital switched data.

WHO'S TALKING TO WHOM

Data is in millions of minutes for public voice circuits; 1995 figures.

Top 10 originators of traffic coming to the U.S.

Originator	Minutes	Percentage of incoming traffic
Canada	2,063.7	29.4%
Mexico	833.9	11.9%
U.K.	678.1	9.7%
Japan	319.1	4.6%
Germany	290.3	4.1%
France	180.9	2.6%
Australia	144.0	2.1%
Korea	140.7	2.0%
Taiwan	108.4	1.5%
Italy	103.6	1.5%

Top 10 recipients of traffic leaving the U.S.

Destination	Minutes	Percentage of outgoing traffic
Canada	2,998.0	19.2%
Mexico	1,915.3	12.3%
U.K.	1,017.4	8.5%
Germany	657.7	4.2%
Japan	574.3	3.7%
France	355.4	2.3%
Dominican Republic	342.9	2.2%
Hong Kong	314.1	2.0%
Korea	312.3	2.0%
Philippines	294.8	1.9%

SOURCE: TELEGEOGRAPHY, INC., WASHINGTON, D.C.

Pricing

The biggest challenge for any user is determining what you actually end up paying for your GVPN service. Pricing, while tariffed, is all over the place. All of the global players have a pricing war room where they try to make the best deal for their clients, sometimes to the detriment of their own pockets. What is paid depends on a number of different factors — what percentage of your traffic is switched vs. dedicated access, how many countries you need access to, how much traffic is intra- vs. intercountry, what kind of relationships your carrier of choice has with the local PTT, and so on.

The best advice for GVPN price shoppers is to know your traffic mix before you sit down to discuss pricing with your contenders. You can leverage significant traffic between two countries or between two global regions, especially if the provider has a matching infrastructure to support your specific traffic patterns.

Once per-call pricing is determined, the carriers roll out the big guns and start performing their magic with discounts based on volume, usage, term plans and service type. This is where the process becomes arcane, with each global provider employing its unique cost efficiencies to generate the lowest price.

A good way to sort through the offers is to develop a detailed requirements list ahead of time, defining what is needed at each site, and have the carriers address these requirements. Be sure to consider:

- Application — Basically, voice, data or video, as well as whether you need intra-office communications, peer-to-peer networking and such. Also determine whether you have remote application needs, such as for traveling sales staff.
- Usage — Who will be using the services, when and how much? And where will calls be going — between offices, local, long distance and, if international, to what countries?
- Features — Authorization codes, type of dialing plan and access requirements.
- Installation and maintenance requirements.

You'll also need a clear understanding of your current infrastructure and costs because you might be able to reuse some of it, and you want to make sure the new deal is indeed a better one. And as always, negotiate for every discount and concession you can.

The future of GVPN services

Providers are heading in the right direction, but there is still a long journey ahead before GVPNs become truly integrated services that are easy to purchase and maintain. In the U.S., VPN services are being offered using Intelligent Network platforms.

Consequently, customers have become accustomed to a broad range of sophisticated service features and functions. GVPNs have yet to offer the same uniformity and range of features.

Furthermore, although global partnering has made the process much less complex, ordering and maintaining a GVPN still means headaches. Worse yet, if you think your current telecommunications bill is difficult to read, a GVPN bill will keep you busy deciphering through the longest, coldest winter.

The good news is that the changing regulatory environment domestically and internationally will mean better and cheaper services for GVPN users. The elimination of telecommunications monopolies and the implementation of the common services provisions as dictated by the European Union will mean a proliferation of services for greatly reduced prices. With the formation of the World Trade Organization by the General Agreement on Tariffs and Trades, access to emerging markets will become much easier while tariffs continue to drop.

You can learn more about the ins and outs of most of the GVPN services online. We've established links to an AT&T site offering info on its WorldSource and Global Software Defined Network services, the Concert site, which includes news of the recent BT-MCI merger; and a Sprint site offering info on Global One. Cable & Wireless, apparently, does not offer online info about its GVPN service.

Enter the number above in the DocFinder box on the home page.

As for choosing among the providers, AT&T retains the leadership position, but each of the other contenders has its strengths. For example, AT&T has the most remote locations, but Global One has more complete uniformity of service in major countries.

So the best strategy is to put out a bid to all four. Chances are you'll find none of them covers everything you're looking for, so you'll have to go with the one that strikes the best mix of features, price, coverage, service and support.

The last two are especially key. You want a company that will be responsive. A few dollars one way or the other shouldn't drive the decision. If you find the price and feature set is within range from more than one provider, pick the one you're most comfortable with. Remember, you're embarking on a steady relationship here, so a good level of comfort is an important commodity.

The world is finally opening up, and as businesses realize the benefits of new markets and make their moves to claim them, global service providers will be paving the way. The future's so bright, you need to wear shades. . .or would that be X-ray glasses?

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NetworkWorld PC WORLD

SERVER TEST SERIES

A monthly feature in which we evaluate file and application servers based on tests conducted in a lab owned jointly with our sister publication, PC World.

The enterprise rides again

By William Rinko-Gay and Lee Schlesinger

With this week's release of the new *Star Trek* movie, we thought it was time to take another look at what's state-of-the-art in enterprise servers. We turned up a new value leader in Digital Equipment Corp.'s Prioris ZX 6200. Though its performance was middle of the road, its relatively low price makes it an attractive choice. We tested Land-5 Corp.'s rack-mounted HPS550 server in two configurations and found the one with the slower CPU to be a better performer. Hewlett-Packard Co.'s NetServer LX Pro was a solid performer and a good value. Acer Technologies, Inc.'s AcerAltos 19000, however, was the worst performing enterprise server still on our list.

ENTERPRISE SERVER

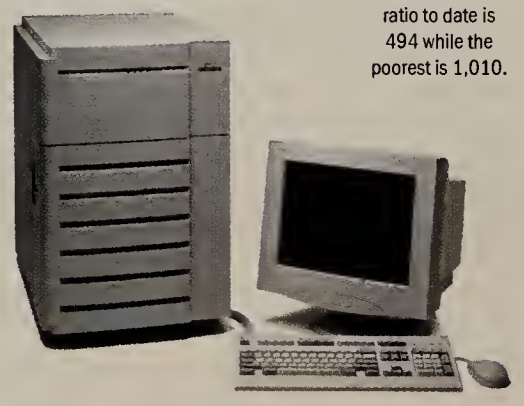
AcerAltos 19000

VENDOR: *Acer*

CONTACT: *(800) 733-2237*

PRICE: *$22,000*

PERFORMANCE RATING: *35.9*



A lower number indicates better value. The best ratio to date is 494 while the poorest is 1,010.

If bigger were better, the AcerAltos 19000 would be the best server we've seen. This behemoth has room inside for 14 hot-pluggable drives and four additional standard drive bays. There's a lot of extra space inside, making for a very serviceable machine. The only thing Acer skimped on was expansion slots — only three of the eight provided actually open.

The AcerAltos 19000 includes a RAID controller (tested at RAID 0), dual redundant power supplies (there's room for three) and ECC memory. Together with the hot-swappable drives, these features should keep your server up and running.

All of this hardware is easily accessible if you have the correct key. If you don't, it's all locked safely away. The drives are easily removed by lifting up a handle and pulling. A sliding lock mechanism ensures you won't remove a drive accidentally.

The AcerAltos 19000 lacks a configuration label such as those we've seen on so many of its competitors, but its manual has a complete set of information on configuration and operation.

Acer offers AcerServer Manager (ASM) Pro server management software for checking the status of your server. The software confused us when it reported that Fan 4 was not working, until we realized that there were only three fans in our system.

However, a stalled fan on a CPU yielded a high-temperature situation that allowed us to experience the impressive alarm capabilities of ASM Pro. The software works under Windows NT, NetWare and SCO operating systems.

The AcerAltos 19000 offers a maximum of two processors, and our unit had 200-MHz Pentium Pros with 256K bytes of Level 2 cache installed, not the 512K bytes with which we've become accustomed.

This put it behind all the quad-processor configurations in our testing, and occasionally behind the single-processor configurations. Priced at $22,000, this machine is relatively inexpensive for its feature set, but we'd recommend that you hold out for a machine that can accept two more processors, or save even more money and get only one processor.

ENTERPRISE SERVER

Prioris ZX 6200MP/2

VENDOR: *Digital*

CONTACT: *(800) 344-4825*

PRICE: *$23,874*

PERFORMANCE RATING: *48.3*

A lower number indicates better value. The best ratio to date is 494 while the poorest is 1,010.

The Prioris ZX 6200MP/2 is Digital's first server to use the Intel Pentium Pro processor. Digital has

PERFORMANCE LEADERS TO DATE

Our performance rating is derived by adding the file server performance in scripts per minute to the average of the two application server test results at the 16-client level.

Model	Issue tested	Top performance
Data General AViiON AV 4900	9/23/96	62.6
HP NetServer LX Pro 6/200 SMP	This issue	55.9
HP NetServer 5/166 LS4	5/27/96	55.4
ALR Revolution Quad6 166/512	7/22/96	54.8
IBM PC Server 720	5/27/96	53.1

VALUE LEADERS TO DATE

We divide the price of the server as tested by the performance rating to get our price/performance index. A lower number indicates better value.

Model	Issue tested	Price/performance
ALR Revolution Quad6 166/512	7/22/96	603
HP NetServer LX Pro 6/200 SMP	This issue	575
HP NetServer 5/166 LS4	5/27/96	531
IBM PC Server 720	5/27/96	518
Digital Prioris ZX 6200MP/2	This issue	494

enhanced the processor technology with a clock-independent, dual peer PCI bus to reduce I/O bottlenecks. Although capable of supporting four processors, this enterprise server came configured with only two. Nevertheless, it compares favorably with the other enterprise servers.

The chassis is no different from other Prioris servers we've reviewed. It's small because Digital expects to serve high storage capacity requirements with external chassis.

Therefore, there's only room for two standard and seven hot-pluggable devices. Along with the drives and their RAID controller, two redundant power supplies and redundant cooling fans help to protect the server from hardware failures. The interior is roomy and easily serviced if you have the key. You can add SIMMs without tools. A configuration label inside the side door is complete and thorough. Wheels on the bottom are a nice touch, though this server is small enough to move around without them.

With only two processors, this server wasn't an outstanding performer — about the middle of the pack in all our tests. However, with a price tag less than $24,000, it's a great value.

Upgrading to a four-way CPU configuration would probably provide the extra punch to turn this machine into a top performer.

ENTERPRISE SERVER

NetServer LX Pro 6/200 SMP

VENDOR: *HP*
CONTACT: *(415) 857-1501*
PRICE: *$32,124*
PERFORMANCE RATING: *55.9*

A lower number indicates better value. The best ratio to date is 494 while the poorest is 1,010.

The NetServer LX Pro 6/200 SMP is HP's latest enterprise server, and it's an outstanding performer. However, the 512K bytes of Level 2 cache in this machine is less than the 1M byte of Level 2 cache per processor on HP's NetServer LS, and the difference shows in poorer database and Notes performance.

The LX model is more expandable, reliable and larger than the LS series. The chassis can hold 12 hot-pluggable drives and six other storage units, and it has two open PCI slots as configured. The LX achieves a greater expandability than the other NetServers we've seen by doubling the chassis configuration. Fortunately, the chassis is on wheels.

Two lockable doors open on the front to reveal a symmetrical pair of drive bay sets. Each set has room for three standard devices (disk, diskette or CD-ROM drives) and six of the same hot-pluggable bays HP's LH Pro uses. Above these doors are the usual switches for power, reset, keyboard lock and an LCD status panel.

Removing the top panel (held in place by thumbscrews) reveals the horizontally mounted system board and all the available PCI and EISA slots. The processor and memory cards are covered by a separate panel that must be removed with a screwdriver.

Once you remove the top, you can lift off the two side panels for access to the drive bays' backplanes for configuration.

Overall, this is a very serviceable unit. The detailed configuration label on the top panel should have you up and running in no time.

In addition to more expansion space, the LX Pro provides enhanced redundancy features. It sports three 410-watt, hot-pluggable power supplies that are held in place by thumbscrews and a key lock. Removing the screws and unlocking the supplies allows you to pull them free for replacement. HP offers an optional Remote Assist card for handling remote management when the server won't respond to the network.

You can also purchase a RAID controller that supports RAID 0 or RAID 5. Our unit didn't use the RAID controller but focused on the two internal network controllers.

As with all HP servers, service and support are excellent. There is bootable read-only memory that contains NetServer Navigator to help configure the machine for your operating system — although HP doesn't provide the operating system or an installation program. Navigator also provides hardware configuration utilities and NetServer Assistant. This latter program can be used to manage your NetServer via HP OpenView (also included) or any SNMP-compatible management program.

At $32,124, this isn't a cheap server, but the high reliability and expandability of this server, along with HP's management software and excellent service and support, make for a good choice in any enterprise.

ENTERPRISE SERVER

HPS550 with DS300

VENDOR: *Land-5*
CONTACT: *(800) 526-8896*
PRICE: *$43,999*
PERFORMANCE RATING: *49.1*

2nd configuration

PRICE: *$38,529*
PERFORMANCE RATING: *45.3*

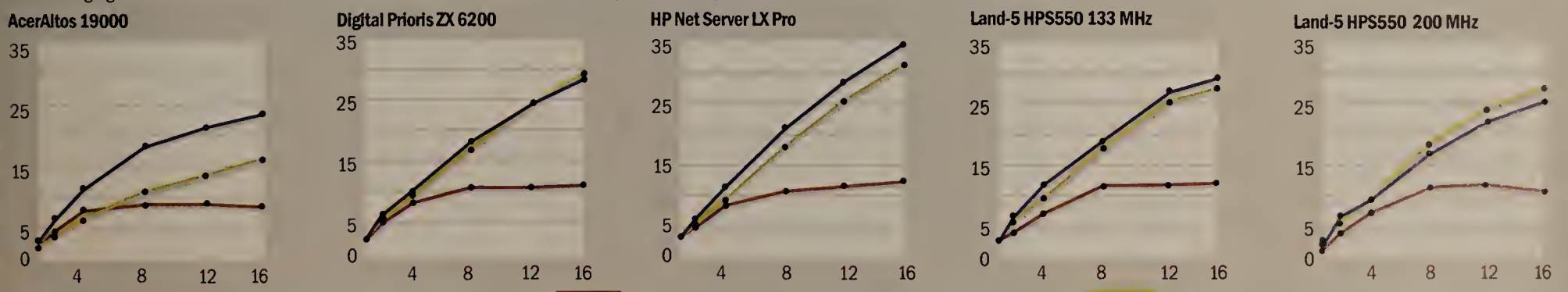
A lower number indicates better value. The best ratio to date is 494 while the poorest is 1,010.

Land-5 sent us an easily upgradable server. We took advantage of this capability to test the four-processor machine with 133-MHz Pentiums and 200-MHz Pentium Pros.

Ironically, the Pentium Pro model wasn't faster than its Pentium sibling, suggesting that this machine is not bottlenecked on processor power. In fact,

PERFORMANCE SUMMARY

We measure performance from the client's point of view and report the time it takes to complete typical tasks. Our performance summary graphs show the results of each test in scripts per minute with numbers of clients ranging from one to 16. Because the tests run faster than a real client could perform the operations, each of our test clients stresses the servers as much as several real users would.



FILE SERVER Our file server tests run scripts on ascending numbers of clients for four applications: Microsoft's Word and Excel for Windows, Lotus' 1-2-3 for Windows and Corel's WordPerfect for Windows. The scripts perform file access operations such as opening, importing and saving files.

DATABASE We have two application server tests. The first is a client/server database test that uses Microsoft Access on the front end and Oracle Server 7.2.2 on the back end. We perform various read and write operations on a three-table payroll management application.

LOTUS NOTES The other application server test uses Lotus Notes Release 4.0. We access multiple views in a database, then each document within each view.

NetworkWorld PC WORLD

SERVER TEST SERIES

Enterprise servers: The inside story

	Acer Technologies, Inc.		Digital Equipment Corp.		Hewlett-Packard Co.		Land-5 Corp.	
Model	AcerAltos 19000		Prioris ZX 6200MP/2		NetServer LX Pro 6/200 SMP		HPS550 with DS300	
Processor	Two 200-MHz Pentium Pros with 256K-byte Level 2 cache		Two 200-MHz Pentium Pros with 512K-byte Level 2 cache		Four 200-MHz Pentium Pro Processors with 512K-byte Level 2 cache		Four 133-MHz PentiumPros with 512K-byte Level 2 cache	
Max. processors	Two 200-MHz Pentium Pros with 512K-byte Level 2 cache		Four 200-MHz Pentium Pros with 512K-byte Level 2 cache		Four 200-MHz Pentium Pro Processors with 512K-byte Level 2 cache		10 200-MHz PentiumPros with 512K-byte Level 2 cache	
Memory	**As tested**	**Maximum**	**As tested**	**Maximum**	**As tested**	**Maximum**	**As tested**	**Maximum**
	128M bytes	1 terabyte	128M bytes	2G bytes	128M bytes	2G bytes	128M bytes	3 terabytes
Slots	**Provided**	**Open**	**Provided**	**Open**	**Provided**	**Open**	**Provided**	**Open**
EISA	2	2	4	4	4	4	4	3
PCI/EISA	1	0	1	1	0	0	0	0
PCI	5	1	7	2	6	4	8	6
Processor	0	0	2	1	2	0	13	8
Bays	**Provided**	**Open**	**Provided**	**Open**	**Provided**	**Open**	**Provided**	**Open**
Internal	0	0	0	0	0	0	0	0
External	18	8	11	2	18	10	4	2
Storage								
Adapter	Mylex DAC960PD with 16M bytes of cache		Adaptec AHA 2940W		Dual Integrated Adaptec AIC-7880P		Adaptec 3940W	
Bus	Fast Wide SCSI		Fast Wide SCSI		Fast Wide SCSI-2		Fast Wide SCSI-2	
Capacity	17.3G bytes		14.7G bytes		12.6G bytes		13.2G bytes	
Model	IBM DORS-32160		Seagate ST32550W		Seagate ST121130WC		Seagate ST32107WC	
Maximum drive capacity	**Internal**	**External**	**Internal**	**External**	**Internal**	**External**	**Internal**	**External**
	9G bytes		63G bytes	1 terabyte	109G bytes		18G bytes	18 terabytes
	2G bytes		2.1G bytes		2G bytes		2G bytes	
CD-ROM	NEC CDR-222 4X SCSI		Bootable Toshiba 5401 TA 4X SCSI		Toshiba XM-5401B4X SCSI		Teac CD-56S 2X SCSI	
Network adapter	Four 3Com 3c595 10/100 PCI		Intel Ether ExpressPro 10/100 Fast Ethernet Controller		Four HP 10/100TX PCI		Cogent Quartet EM/400	
Fault tolerance features	ECC RAM, hot-swappable drives, two or three redundant load-sharing power supplies, RAID 5 controller (tested at RAID 0)		Redundant power supplies, redundant fans, ECC logic in system (standard memory for ECC reliability), RAID 5 capable disk controller with optional battery backup for cache, optional remote server manager card, hot-swappable drives, available clustering		ECC memory and memory scrubbing, redundant fans, ASR, temperature and voltage monitoring, hot-swappable drives, modular hot-swappable power supplies, HP Remote Assist card (optional), RAID 5 (optional)		ECC, RAID controller, redundant hot-swappable power supplies, hot-swappable drives	
Security features	Several security locks, BIOS passwords, setup control, disk drive control, monitor control		Chassis lock, floppy and hard drive door locks, boot and supervisor passwords, server mode, boot sector protection		Chassis lock, start-up passwords, keyboard lock, EISA configuration password, enable and disable ports and floppies		Removable keys, user and supervisor passwords	
Bundled software	ASM Pro server management software		ServerWorks suite of manageability tools, including ServerWorks Quick Launch, ServerWorks Manager V 1.1 with ServerWorks workgroup administrator, ServerWorks Manager application and SNMP agents		NetServer Navigator (setup support), NetServer Assistant (server management software), Utilities, OpenView for Windows, HP Remote Assistant (optional)			
Miscellaneous	Three-year, second-business-day, on-site service, four-way interleaved memory		7x24 toll-free support, three-year, on-site, next-day service, memory can be expanded to 4G bytes but is limited by current SIMM capacities		7x 24 toll-free support, three-year, on-site service		5x12 toll-free support, two-year, on-site optional service, advance replacement	

the close scores overall tell us that the Land-5 is held back in the PCI bus or the disk array adapter.

Land-5 produces only rack-mounted servers. The HPS550/DS300 combination that we tested houses the CPU in one chassis and the hard drives in another. This system is designed for high uptime, with dual power supplies in both the CPU and drive chassis, a RAID controller, hot-swappable hard drives, redundant hot-swappable power supplies that autosense input voltage, ECC memory, and built-in modems for out-of-band management of the disk subsystem and the processor.

This redundancy is complimented by high upgradability. We tested the machine with four 133-MHz Pentium processor cards and then with four 200-MHz Pentium Pros. Under Windows NT Server 4.0, you can go to 10 processor cards in the same system using C-Bus II from Corollary, Inc.

Six Seagate Technology, Inc. Barracuda drives gave us 13.2G bytes of storage, but we could have gone to 18G bytes in the current configuration, or 18 terabytes with additional DS300s.

The power switches require keys. There are plenty of status lights to let you know what's going on with individual components within the system, as well as an LCD display with status information on the drive chassis.

The front panels of both units pull down. In the drive chassis, it's easy to pull the hot-swappable drives and replace them.

With the Land-5 adapter, if you mix up the order when replacing drives, the status panel lets you know which drive is in the wrong place.

When you pull off the front panel and the top of the CPU chassis, you have complete access to all the components for easy configuration and maintenance.

Land-5 doesn't provide network management software with the computer. They do include their Early Warning System, EWS-100, which uses the status lights and LCD panel to alert you to problems. With a small hardware upgrade, EWS-100 can also set off alarms in your computer room.

EWS-200 puts several monitoring circuits in the computer, which you can access via a terminal attached to the parallel port. EWS-300 is a Web-enabled management package that provides all of EWS-200's monitoring information over the network using a standard Web browser.

At $43,999 for the Pentium-based unit and $38,529 for the Pentium Pro-based server, Land-5 won't win any price/performance contests.

But it will keep you happy if you need high-redundancy, upgradability and optional Web-based management tools. ■

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Briefs

■ **Productivity Point International (PPI)** *now provides online registration and training course scheduling information on its Web site at* **http://www.propoint.com**.

The Web site provides course descriptions, certification requirements and links to class schedules. That information is searchable by course name, time, city, state and region. In addition, training managers can download free copies of PPI's proprietary skills assessment software application to help determine employee, department, division and corporate training needs.

PPI: (630) 920-5451.

■ **Hewlett-Packard Co.** *has entered into a training partnership with* **Netscape Communications Corp.**

HP will offer Internet Server Administration courses to help those who install and manage Netscape Enterprise Server, Proxy Server, News Server and Mail Server software. The two- and three-day instructor-led courses will begin next month at HP Education Centers in Atlanta, Boston, Chicago, Dallas, Detroit, Los Angeles, New York, San Francisco, Toronto and Washington, D.C. Initially, the courses will be for Unix platform users, with classes for Microsoft Corp. Windows NT users to follow next year.

Price ranges from $800 to $1,200.

HP: (800) 472-5277.

■ *The Computer Security Institute (CSI) will add* **"Windows NT Security"** *to its training curriculum beginning next year.*

The course will cover options for securing Microsoft Corp. Windows NT after installation and how to manage NT security across heterogenous network platforms. The two-day course will be offered in Arlington, Va., Gaithersburg, Md., San Antonio, Texas, San Francisco and Washington, D.C.

Pricing for the course runs between $485 and $745.

CSI: (415) 905-2626.

Mapping out the project approval process

To get your project plans approved, let management think they came to your conclusion about what's best.

By Peter Smolens

Gaining approval from upper management for that networking project you know will solve a nagging business problem is a process all its own. You've got to gather detailed information about the problem and potential solutions, and then prepare a crackerjack report that will leave executives no other choice but to agree with your recommendations.

To do this, you need the right ammunition, which starts with understanding the problematic business process as experienced by the people using it.

Getting in the trenches will help you gather the hard facts and figures you'll need to make your case. Just telling management you need to buy equipment with faster processors and more memory in order to produce quicker response time is not enough. You will have to show them how that improved response time will lower the cost of doing business or increase productivity.

So as you arm yourself with data, make sure you answer these questions: Who will benefit from the solution? How will this solution benefit them? How much will it cost?

You may also want to query others in the networking or computing fields. "No man is an island," says Stewart Black, president of Mid-Range Consulting, Inc. "The computer field has many people who have devoted their lives to understanding specific areas of business and can provide a diverse area of expertise."

Vendors can also be aids. Compiling facts and figures about the price/performance ratio of their equipment is one area where vendors can help. Alternatively, they can put you in touch with a business partner that has expertise in solving the type of problem you face.

Form alliances

One source of expertise many people surprisingly overlook is right under their noses — the managers of other departments. You know networks, but others in your company know accounting, personnel or manufacturing. You can use their talents to help you sell your ideas — especially if the idea will benefit them — and to show executives you have allies.

Use your fellow managers to look at all sides of the problem. Often they will suggest a different approach.

"Many ideas radically change during this time," said John Diley, a retired director of information services. "Other people may have a better solution."

When you've laid the groundwork, it's time to whip up a report for management. Pessimists will say that creating a report gives management more ammunition to turn your project down. So you must make the report a sales tool instead of a casualty.

You can do that by making sure the report:

- Defines the problem.
- Introduces a range of possible solutions.
- Identifies the solution you consider to be the best.
- Explains how you will properly implement the solution.
- Lays out the full cost.
- Explains how the company will benefit.

"Give the report a title," Black suggests. "One that defines what is going to be in the document in a clear, professional manner and signifies that it is important."

Black also suggests having an index that lets the reader quickly move to specific sections. When writing the report, remember your readers and be careful to speak in a language they understand. Don't let computer jargon slip into the text.

Diley suggests using the introduction or forward section to state the problem and show why it needs to be corrected. "Your introduction should draw a picture in readers' minds that they can understand," he says.

The introduction can be followed by a summary section, which many believe is the most important one. "Present your full solution in bullet-list fashion," Black says. "Include highlights of what the solution will entail. This way, the readers can get an overall feel for the report without going into the more detailed sections."

In the rest of the report, show the pros and cons to all solutions, but present the case for your solution in a more positive manner. Be straightforward and honest about all the costs involved.

Include charts and graphs to show how you plan to solve the problem. Use these facts and figures to show the reasons why one solution is better than the rest, even though it might be more involved. If you present your case correctly, management will make the right decision based on your argument, and not on which solution costs less.

The last section should show how you plan to implement your solution. Here again, give all the information you can, such as how long it will take to install equipment and train personnel. The point here is to provide information to enforce the picture you created in the reader's mind in the introduction.

Of course, it wouldn't hurt to make your case in a way that leads executives to reach your conclusion on their own.

"The key here is to convince management to think that they came up with your idea," says Patrick Dunn, director of the Houston office of Rust Consulting Group, which helps build large database systems for the research industry. "That way, they will suggest the changes, and your idea will be approved."

Once the report has been presented, expect to make modifications. Management often has a slightly different view of how to solve the problem.

But if you have led management down the path so that the decision they made is based on your solution, at least those changes will be to something you know will work.

Smolens is a senior systems analyst at the American Diabetes Association's National Center in Alexandria, Va. He can be reached at smolepr@diabetes.org.

Software Engineer Analyze data and develop applications that involve interface between IBM mainframe (DB2) to SYBASE System 11/MS SQL Server in Windows NT operating system. Using Visual C++ as the front end development tool. Maintain data integrity and system functionality in a multi-platform (UNIX, Windows NT, MVS) and multi-processor environment Migration experience of MAINFRAME based application to client server application required.

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Department: Networks & Distributed Computing, Computing and Communications
(Reference, 96-478)

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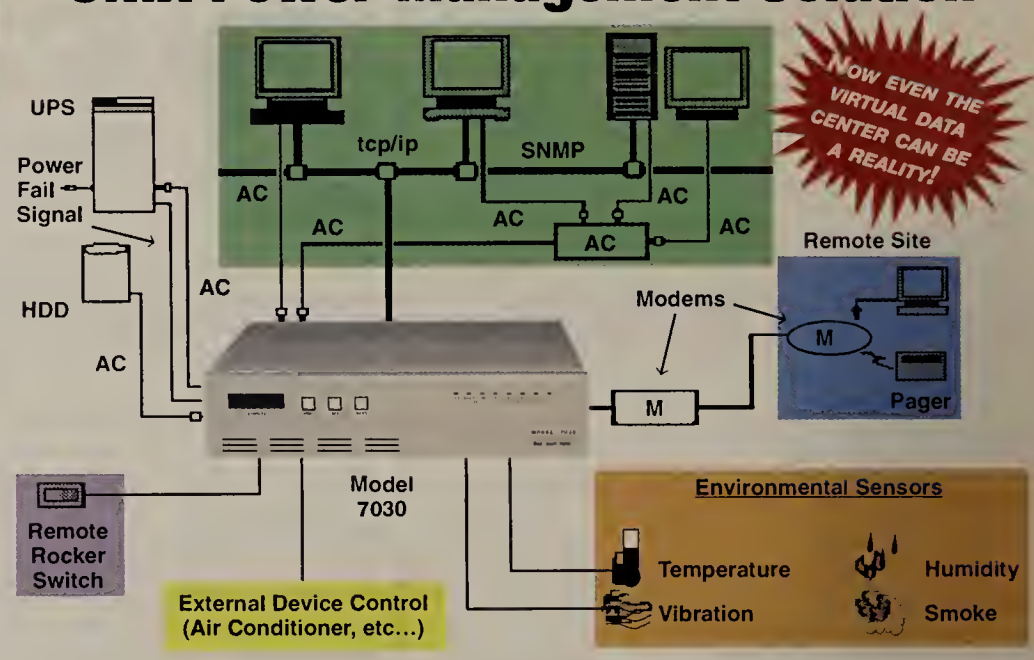

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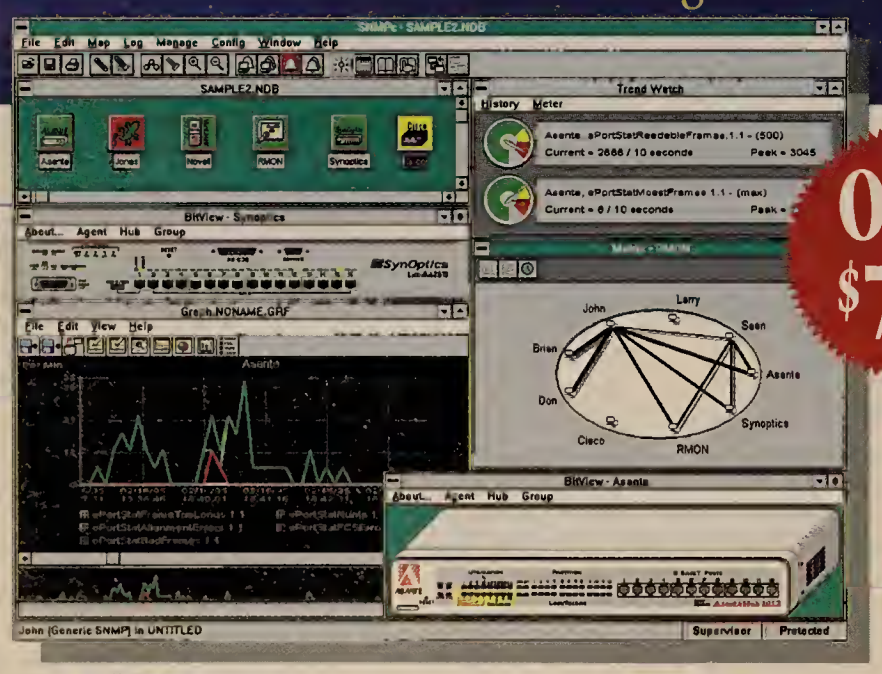

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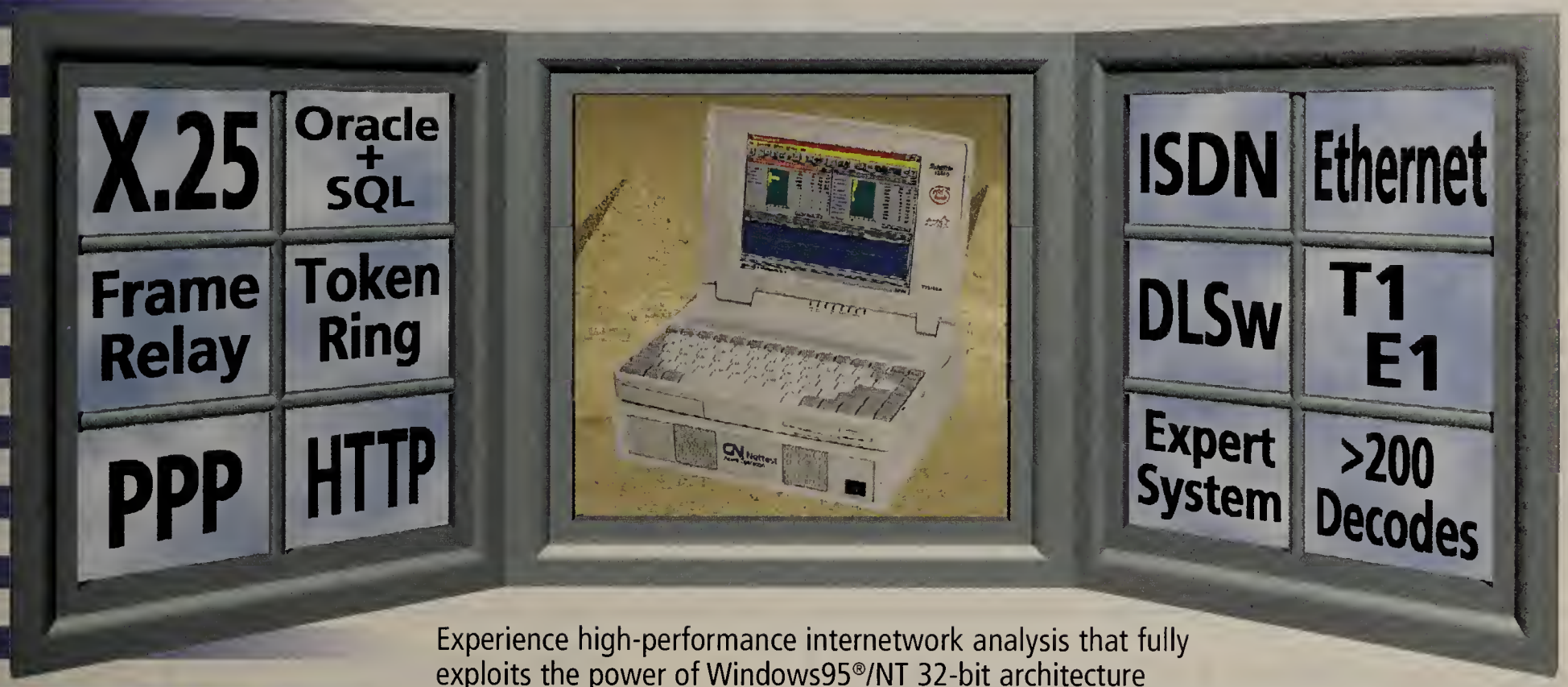

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>200 Decodes	Yes	No	Yes	No
WAN over PCMCIA	Yes	No	No	No
3-Tier Expert	Yes	No	No	No
Oracle Decodes	Yes	No	Yes	No

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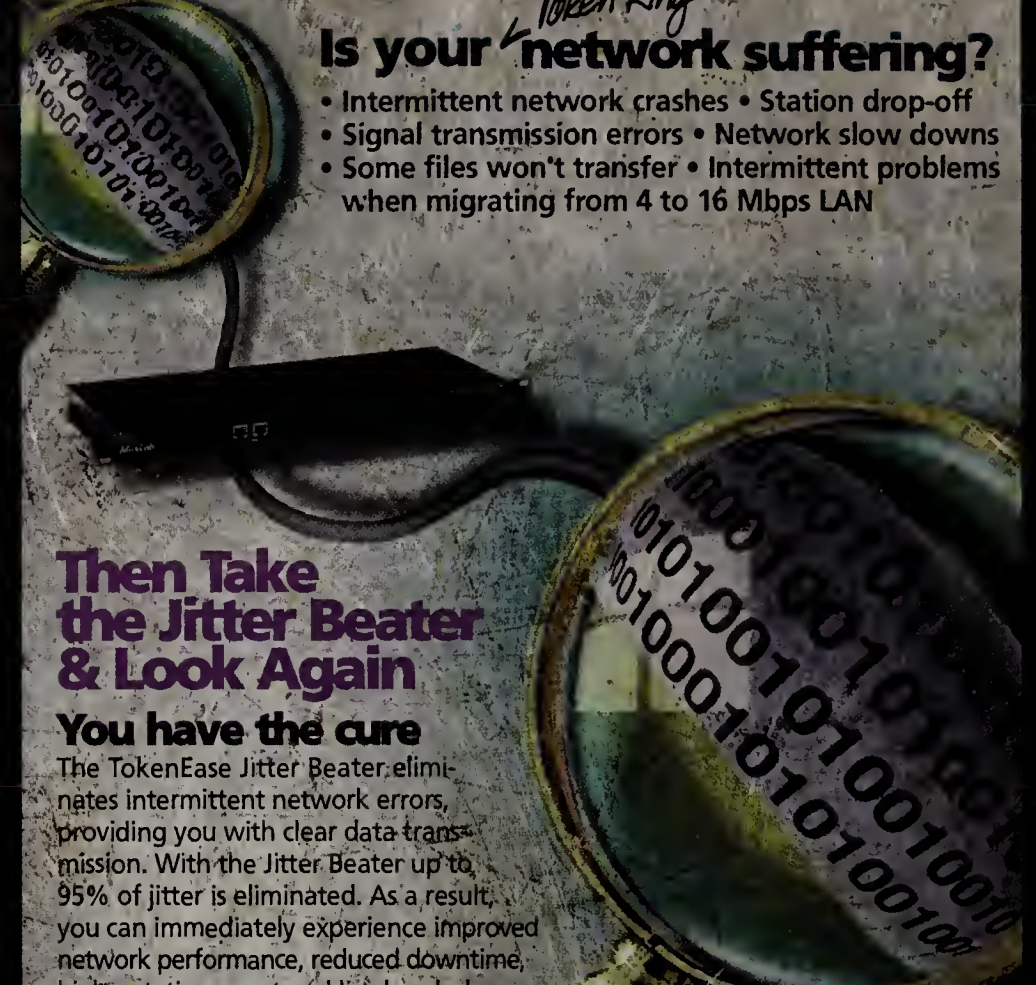

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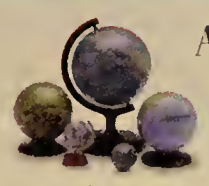

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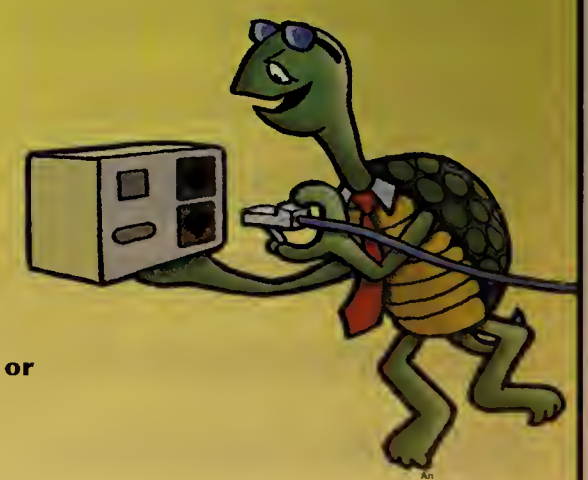

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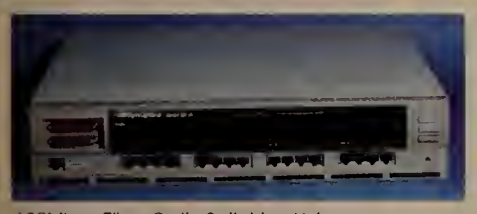

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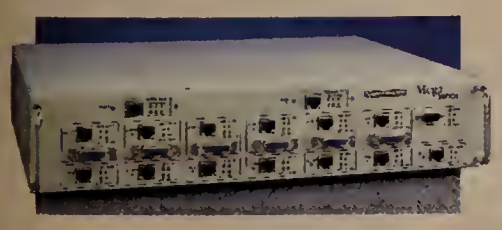

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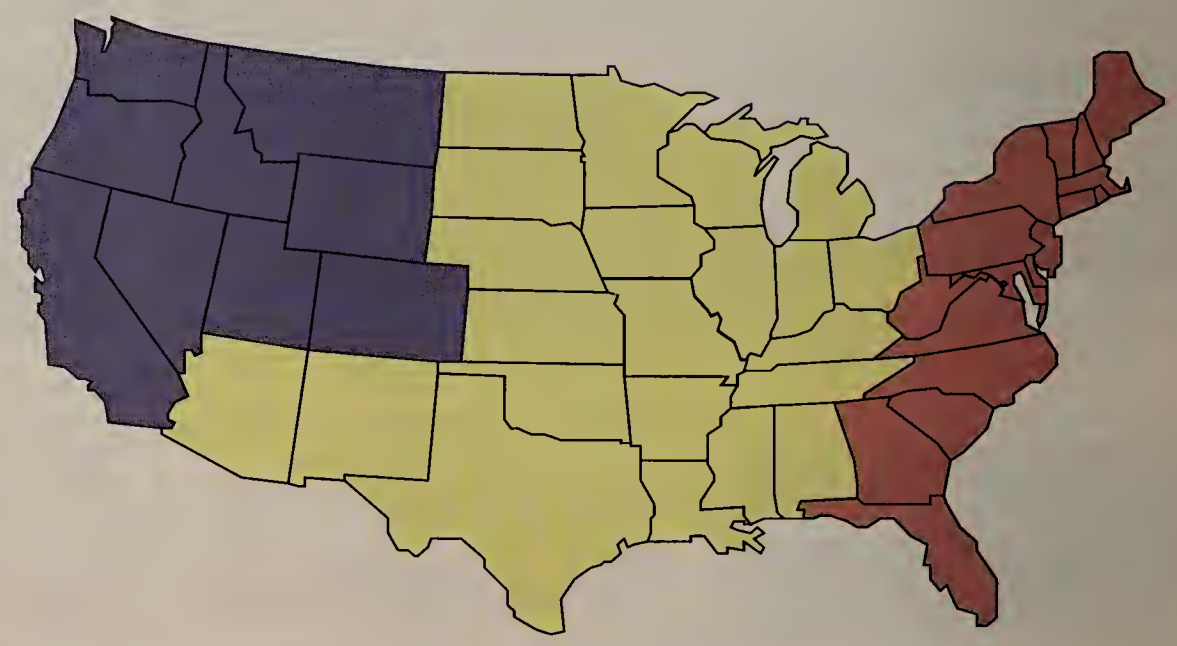

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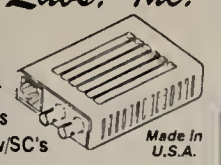

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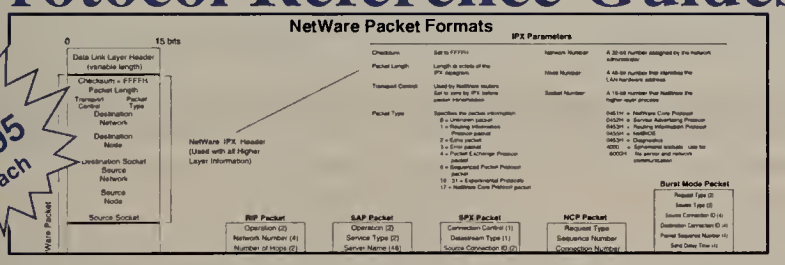

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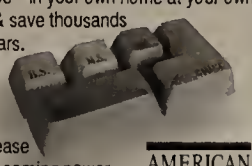

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NC

Continued from page 1

beta, relies on Sun's HotJava Web browser. But HotJava has still not hit beta and, when released, may lack a wide range of bleeding-edge Web functions, such as 3-D interfaces via Virtual Reality Modeling Language. Many of these functions are available in browsers that run on Microsoft Corp.'s Windows, through the use of third-party software, called plug-ins, that are written for that platform.

For the purpose of this story, an NC is defined as a desktop device that consists of a CPU, monitor, keyboard, mouse and some amount of local memory. It also relies on the JVM, JavaOS, a Java-enabled browser and a connection to a server. It may be more accurate to call NCs "Java thin-client computers."

MIS managers should be aware, however, that most Java thin-client vendors are also incorporating some kind of software that will let their devices access existing applications on Windows or Unix servers, or both, and terminal emulation software that will let them access mainframe and Application System/400 applications.

Let's get thin

The two issues that create potential limitations for MIS groups have to do with the capabilities of the NC's Web browser and the number of Java applications or applets actually available for the NC to execute.

The key NC browser, HotJava, will be released next year both as a stand-alone product and as part of the JavaStation's built-in software. Today, HotJava (in alpha test) supports HTML 3.2, table and frame viewing, and can run any Java applet built with the current release of the Java Development Kit (JDK).

Plug-ins are another story. "The plug-in coverage is not there," acknowledged Carole Amos, JavaSoft's HotJava product-line manager. "But we expect people to start building applets for this, especially with the new version of the JDK [due in first-quarter 1997]." Plug-ins only work for the specific platform for which they were written, she noted.

But whether these current deficiencies are in fact problems hinges on what you want in an NC. If your users need a 3-D interface or the ability to play audio files, you have a problem for perhaps the next six to nine months. If they only need access to HTML documents and the ability to run their own custom Java applets that work with the server applications, Java browsers will likely be adequate.

The relatively small portfolio of available third-party Java applications, compared with that for Windows, may be another constraint. But there is more than one way to skin a cat — or an application.

Server software vendors are quickly churning out Java front ends, which will run on the Java NCs. Some desktop software vendors are recasting their applications to run on Windows application servers, but download to a Java client on the NC.

Critical for Java is how well it will perform. This performance hinges on a range of variables: the efficiency of the Java code compilers, the implementation of the Java Virtual Machine and the CPU used by the thin-client computer. Every NC has to be configured to communicate with at least one server at the outset, from which it usually receives its allotment of applications and authorizations (but some NCs have built-in firmware that lets them boot themselves). This initialization server sometimes must be a particular brand. For example, JavaStations will link with Solaris servers. If you're not a Sun server shop now, you will be if you choose JavaStations.

Many of today's NC limits will be overcome with commitment and programming savvy. But just how far the NC will take us is a question only time will tell. ■

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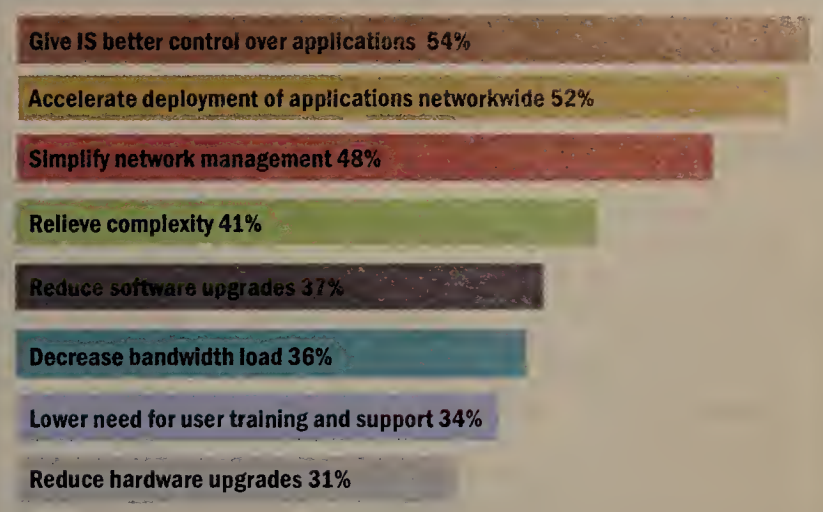

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Corel

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full suite of Java-based productivity applications.

"We are talking to them on multiple levels, and obviously Java has come up in the discussions," said Chris Biber, Corel's technology evangelist. "There's a great strategic fit. But that's all that can be said at this point. Nothing is decided."

According to Biber, possible scenarios could entail:

■ Office for Java bundled with Netscape's SuiteSpot servers. Prices would vary depending on the number of Communicator and Corel clients sold. There could be a blanket license, or licensing terms could vary based on the number of clients.

■ Netscape's Communicator being bundled with Corel's Office for Java, with a package price for the combination.

■ Office for Java appearing as an icon on the screen of Communicator's Constellation component, the code name for new Netscape technology that helps users customize their desktop environments (see story, page 7).

Netscape refused to speculate.

"This business changes really fast," said Mike Homer, Netscape's senior vice president of marketing. "And a contract isn't signed until it's signed. And all these companies talk to each other about all kinds of things all the time."

He stressed that Netscape's strategy is to compete in the E-mail and groupware space, with its new Communicator client, not office suites.

But if the Corel-Netscape allegiance were to materialize, that could shake up a marketplace that has been a one-horse race for quite some time.

"There will be people up at night worrying about it," said David Smith, research director of Internet strategies for the Stamford, Conn.-based Gartner Group, Inc.

"It makes absolute sense for Netscape and Corel to be working together. I would be surprised to not see a partnership of some type between those two," Smith said, adding the Java forces need to have something like this to harbor any hopes of establishing a serious alternative to the Microsoft environment.

Corel has not only been involved in discussions with Netscape. The company, based here, also has been talking about possible bundling agreements with every network computer vendor, including Oracle Corp. and IBM, Biber said. Corel also is currently shipping a test edition of Office for Java with Sun Microsystems, Inc.'s Netra j servers, as well as exploring additional arrangements, he added.

Biber said announcements can be expected during the next six months.

Commercial availability of Office for Java is expected in the first-quarter 1997. ■

Sports scores are fact, and to hell with electronic commerce

Our government certainly has a thorough and perceptive grasp of the implications and potential of information technology. Not.

The last event that made it clear Uncle Sam doesn't get it was the Communications Decency Act. The CDA was an appalling piece of cupidity, stupidity and politicking by the White House, and it was quite rightly overthrown by the courts.

But folks, if there's one thing we know, it's that our friends in Washington have poor memories. And when it comes to telecommunications-related issues, not only do they not get it, they don't learn from their experiences.

By now, you would have thought that they might have figured out that the computer business evolves rapidly, to say the least. Technologies emerge faster than political scandals and disappear almost as fast as Whitewater documents.

"So," you might be saying, "what's got him all fired up this week?" You're right, there is something.

We are about to witness another interesting (read: terrifyingly stupid) event that has implications at least as profound as the CDA. In the offing is a proposal for a new legal environment that would regulate the ownership and control of information that we currently think of as being in the public domain.

The proposal covers "Texts, sounds, images, numbers, facts, or data representing any other matter or substance." And copyright will be granted for data in which the owner has a "substantial investment in the collection, assembly, verification, organization or presentation of the contents."

This is outlined in a draft treaty tabled for next month's meeting of the World Intellectual Property Organization in Geneva. It concerns databases and specifically defines what databases are and how their contents will be protected.

If the proposal is turned into legislation, it would require the U.S. and other signatories to create a new property right for public domain materials.

The result will be that the "rightholder," aka the database owner, will have extremely broad powers to "authorize or prohibit the extraction or utilization" of the information from the protected database.

One of the many consequences of the treaty will be that Web crawlers will become illegal.

The consequences? For example, under the proposed treaty, the baseball league would own all (really all, not some) of the "facts" (scores, statistics, and so on) about all games, and the league would be able to set the terms under which any of these facts are published.

Now if only sports scores were affected, the treaty wouldn't be that big a deal. But one of the many consequences of the treaty will be that Web crawlers will become illegal.

Indeed, much of the free flow of information that we see on the 'Net today would be severely constrained, and even stopped, by this legislation. Great. Just what we need. Just as electronic commerce is starting, let's build in a poison pill.

The trouble is, there are a lot of vested interests involved. For example, legal publishing giant West Publishing is, not surprisingly, very much in favor of the treaty. The reason it's not surprising is West wants to be able to copyright (and I'm not kidding) *page numbers* in their legal publications (it's a long story but that's essentially the heart of the matter).

This treaty must not be allowed to become law. If you'd like to read a very good discussion of the proposed treaty, you can find a copy of an article written by James Love of the Consumer Project on Technology at www.essential.org/cpt/ip/wipo-sports.html.

In his article, Love quotes American University law Professor Peter Jaszi's comment on the treaty: His concern is that the treaty represents "the end of the public domain."

Let's hope this nonsense dies an early death.

What's your take? Is this as bad as it looks, or worse? Drop me a note at mgibbs@gibbs.com or call me at (800) 622-1108, Ext. 504.

Greek and Latin hold key to wealth of industry insights

The most bizarre part of Comdex/Fall '96 is not the gaudy city of Las Vegas — it's listening to conversations of conventioneers. Comdex is the only event in the world where everyone speaks Greek and Latin. Every other word is kilo-this, mega-something and giga-that.

Most of us hate to admit ignorance of these terms. Sure, we vaguely know what they represent. But heaven help us if a real human uncovers our secret!

In the beginning (of computers, that is,) the word was *bit*. Appropriately, bit is an acronym, meaning binary digit. A bit is either on or off.

Eight bits equal 1 *byte*, also known as a character to human readers. About 10 bytes equal one word; 100 equal a telegram. Telegrams used to be an adequate communications tool when people were terse and knew when to shut up.

A *kilobyte* is 1,000 bytes. (OK, 1,024. I lied.) Kilobyte comes from the Greek word *chilioi*, meaning a thousand.

These days, it's cool to drop everything except for the K. For example, 1K equals a short story, too short to get an A; 10K equal a page of information from the encyclopedia, or a securities report exposing a company's dirty laundry; 100K is a low-resolution photograph, or a salary not worthy of management.

The newest trend is to own gigabyte disk drives. You learn their true size when backing up this drive with floppy disks.

So much for kids' stuff. We now graduate to the world of the *megabyte*, which is a million bytes. The Greek derivative is *megas*, meaning great. They were too busy philosophizing to count to a million.

A megabyte equals a Travis McGee novel, which author John D. MacDonald could have fit onto a 3.5-inch floppy diskette if the PC had existed then. Two megabytes (slang: 2 megs) equal a high-resolution photograph — the kind kids and sex fiends trade over the Internet.

One minute of high-fidelity music fills 10M bytes, while a digital mammogram requires 50. You can shoehorn a meter-high stack of books into 100M bytes, and five times that onto a CD-ROM.

The newest trend is to own *gigabyte* disk drives. That's a billion bytes, derived from the Latin *gigas*, or giant. You learn a gigabyte's true size when backing up this drive with floppy disks.

A gigabyte equals a pickup truck filled with paper, or a symphony in high-fidelity sound, as in, "Hey, man, did you catch the Stones' last gig?" Five gigabytes fit onto an Exabyte Corp. 8mm backup tape, while 20G bytes represent the digitally recorded works of Beethoven, or Bill Gates' net worth (in dollars, not bytes). Fifty gigabytes could hold a library floor of books. A floor of academic journals, however, would require 100G bytes, half for footnotes. We can also thank the Greeks for *terabyte*, derived from *teras*, or monster. A terabyte is a quadrillion bytes, the amount of data NASA expects its 1998 Earth Observing System (EOS) to create each day. Only a government agency in search of a raison d'etre could publish that much data. Ten terabytes equal the contents in the printed collection of the Library of Congress.

A *petrabyte*, derived from the Greek *pente*, or fifth, is a quintillion bytes, or three years of EOS data. Two "pets" equal the contents of all U.S. academic research libraries. Twenty petrabytes equal the capacity of all hard-disk drives manufactured last year; 200 petrabytes equal *all* printed material, or the production of digital magnetic tape last year.

An *exabyte* equals 1,000,000,000,000,000,000 bytes. Five of these suckers equal all the words ever spoken. Exabyte is also the name of a tape-backup company, which clearly had delusions of grandeur.

Finally, there are zettabytes and yottabytes. These Latin-based numbers are out there somewhere. Trust me.

That's it. Now you've got the lingo down pat. When the federal deficit numbers come in, we'll hit Chapter 2.

Thanks go to Roy Williams at Cal Tech for inspiring this column. He's at www.ccsf.caltech.edu/~roy/.

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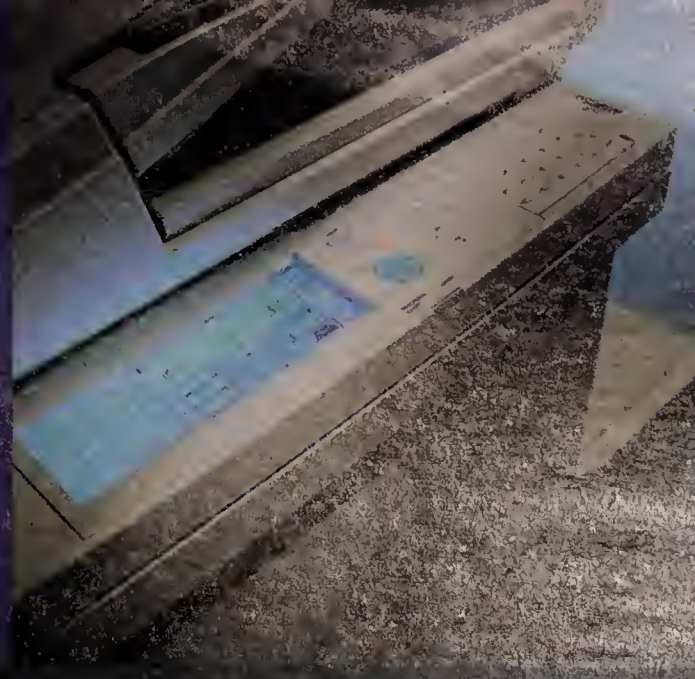

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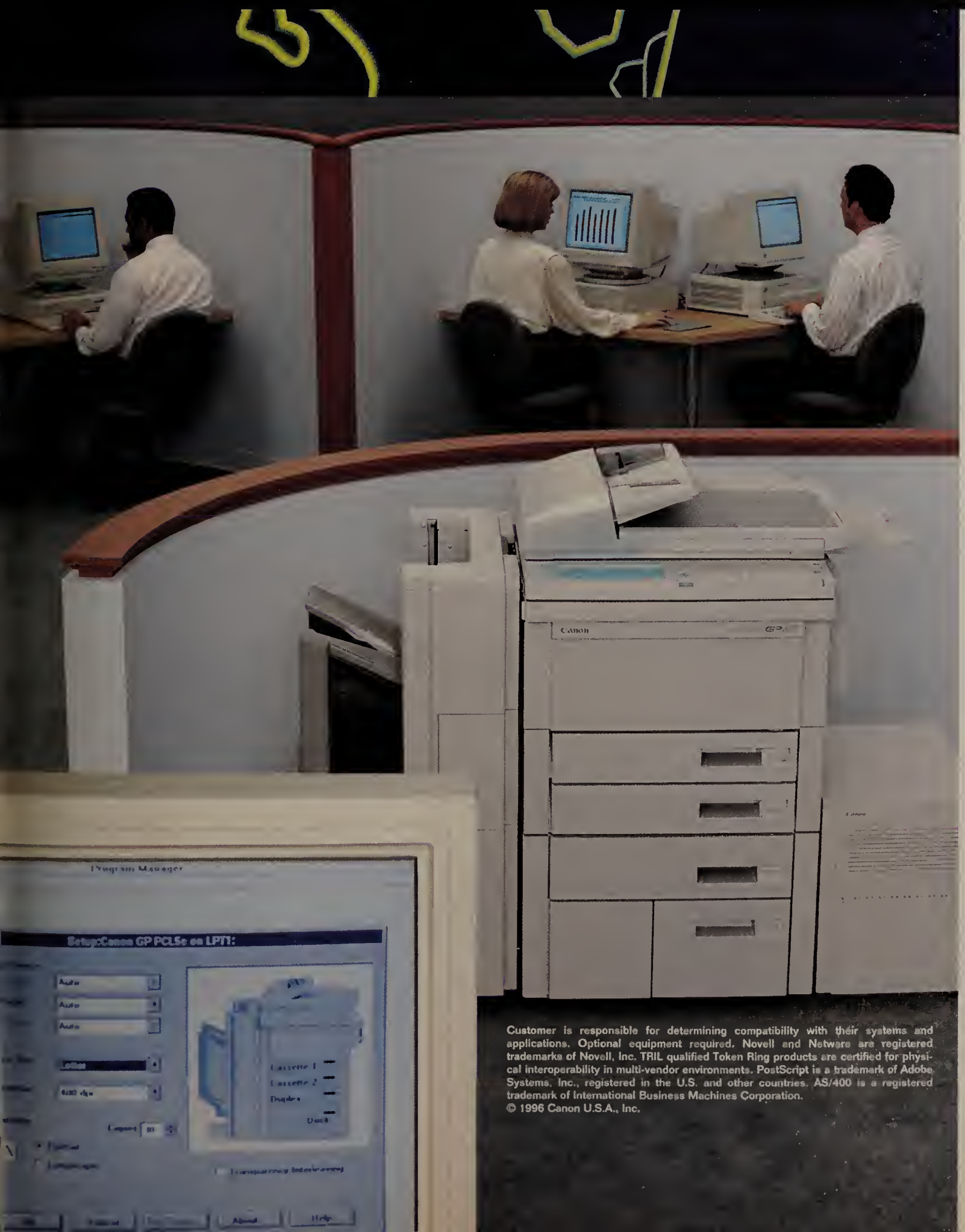

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